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VISUAL EDUCATION

THROUGH

STEREOGRAPHS AND LANTERN SLIDES

SCHOOL WORK

VISUALIZED *and* VITALIZED

TEACHERS' GUIDE

TO CROSS-REFERENCE CLASSIFICATIONS
ON DIFFERENT SCHOOL SUBJECTS
EDITED BY 62 LEADING EDUCATORS
AND BASED ON THE

KEYSTONE "600 SET"

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VISUAL EDUCATION

THROUGH

STEREOGRAPHS AND LANTERN SLIDES

SCHOOL WORK

VISUALIZED and VITALIZED

TEACHERS' GUIDE

50 Cross Reference Classifications
on Different School Subjects
Edited by 62 Leading Educators
and based on the

KEYSTONE "600 SET"

KEYSTONE VIEW COMPANY
(INCORPORATED)
EDUCATIONAL DEPT. MEADVILLE, PA.

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KEYSTONE VIEW COMPANY

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PUBLISHERS' STATEMENT

The copyright notice on the opposite page tells an interesting story. It records the date of the introduction into school work of a set of stereographs and lantern slides specifically selected to meet school needs and with cross reference classifications to make quickly available the teaching content of the set. The other copyright notices indicate the dates when the first set and plan, originated by Keystone, were revised and improved.

When the schools first turned to the stereograph and slide as the most effective forms of visual instruction materials, it was soon determined that the standard sets of Travel Tours then in common use for public and private libraries did not meet class room requirements. There was need of a carefully selected set of scenes closely fitted to the regular course of study. The Keystone View Company noted this need and, with the help of progressive school people, pioneered this field by bringing forth the first school set supplied with the cross reference index plan — the Keystone "600 Set" with the Teachers' Guide.

The success of the first set equalled the best expectations. The schools found in this set of stereographs and slides just the material needed to make their class-room instruction most effective. It was widely used and with the later revisions has found a place in thousands of schools. From this extended use under actual teaching conditions there have come the suggestions and improvements that have made the present development and efficiency possible.

Out of the accumulated experience based on the use of the Keystone "600 Set" in thousands of class rooms, there has come the present "600 Set." It is a thorough revision both as to photographic content and editorial work. Thousands of dollars were expended to get the subjects our educational advisors deemed *essential to the set.* The whole world was

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GENERAL INTRODUCTION

By Charles W. Eliot, Ph.D.

President-Emeritus of Harvard University

TRAINING THE POWERS OF OBSERVATION, MEMORY, AND CORRECT DESCRIPTION ALL TOGETHER

I have been urging for some years past that American education is seriously defective in that it provides an inadequate amount of training of the senses, particularly of the eye. It relies far too much on book-work. There ought to be incorporated into elementary and secondary school work a much larger proportion of accurate eye-work and hand-work combined with simultaneous training of the memory and of the capacity for describing correctly, either orally or in writing, things observed and done.

The Keystone View Company of Meadville, Pa., manufactures admirable material for just this training of children and adolescents. This Company provides schools with stereographic views, stereoscopes, and lantern slides to illustrate physical, political, and commercial geography, United States history, nature study, arts and crafts, domestic science, national industries, and architecture. The stereographs and stereoscope are used in class-work at regular study and recitation periods, the lantern slides for reviews and lectures. On the back of each of the stereographs is a printed description of the scene or object represented, which may be read by the pupil after he has himself studied the stereograph in the stereoscope. Each pupil is expected to remember what he has seen long enough to describe it orally in the class, or to write a short composition on it after an interval. The teacher may or may not help the pupils to discern and take in all there is to be seen in the stereograph. Once a week or once a fortnight the topic which has been thus dealt with in the recitation room may be reviewed by the teacher before the class by means of the corresponding lantern slides; and another composition may then be

is directly applicable all through life in dai
n increasing his knowledge, and developing h
process differs entirely from looking passive
es for an hour or two. That looking yield
a transitory entertainment; for it cultivates
ry nor the power of correct description. Impr
each other so rapidly that few are fixed in t
ne spectator is not called on for any mental
Sometimes, of course, strong emotion may fi
which would otherwise be fleeting.
the review with lantern slides, every pupil sho
tunity to lecture for a few minutes on a slide
Reciting on the stereographs and lecturing o
o more for the pupil's enunciation and clearne
than much reading aloud from a book. Engli
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All active-minded and ambitious teachers
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variety of subjects and in all th

CONCRETENESS IN EDUCATION

By William C. Bagley, Ph.D.

Director School of Education, University of Illinois, Urbana, Ill. Author: "The Educative Process"; "Class Room Management"; "Craftsmanship in Teaching"; "Educational Values"; "School Discipline." Joint Author: "Human Behavior." Editor: *School and Home;* Joint Editor: *Journal of Educational Psychology.*

It is an old saying that experience is the best teacher. One may, indeed, go beyond this and say that experience is the only real teacher. If we wish to learn about regions that we have never visited, we study maps and pictures and verbal descriptions of these regions, but our study is quite futile unless we are able to translate these maps and pictures and words into our own experiences. We cannot understand an event in history unless we are able to imagine ourselves in the same situation that conditioned the event, and in order to do this we must have had experiences which we can recall and reconstruct into a likeness of the situation. We cannot comprehend an industrial process unless we can call upon our experience to interpret the various phases of the process and their relations to one another and to the process as a whole. Theoretically, the most effective kind of education is that in which the learner is brought face to face with actual concrete situations. Theoretically, geography is best taught by travel, inspection, and surveys; civics by actual participation in social enterprises; industry by actually turning raw materials into useful commodities. But there are many difficulties in the way of realizing these theoretical advantages of direct learning through actual experiences. Not only is the expense in time and money often prohibitive, but the very complexity of the actual experiences themselves may easily confuse the learner; he is quite likely to be distracted by the multitude of details, and the important lessons are then certain to be overshadowed and obscured.

Effective teaching depends very largely upon the ability to choose just the right details that will force home the important lessons; to provide an abundance of concreteness at just the right point. The teacher who is really an artist in the

: most useful only when they accurately portr
ns in a way that will insure a maximum ‹
ıstrations in the best modern textbooks are us
from the point of view of their accuracy,
:y represent typical situations. The approach
r, is much more closely realized by pictures
the stereopticon, by moving pictures, and t
The advantage of the stereograph in ins
of reality lies in the fact that the objects pic
three dimensions. In this respect it is superi
y projected picture in which the approach
ed by magnifying the size of the objects re
elementary education it is even superior to th
in which the illusion of reality is due to m
reograph also has the advantage of being mor
le to classroom conditions than any form of

irst need, of course, is for accurate and ty
ken by skillful stereoscopists under the gui
in the various fields. This need is happily
stone set No. 600. This set includes a ric
s, representing a wide range of regions and
ws have been carefully selected and are syste
l.
econd need is for supplementary and interpr
ınd these are supplied by the explanatory te
of each slide and by the Teachers' Manua

HOW TO STUDY STEREOGRAPHS AND LANTERN SLIDES

By Frank M. McMurry, Ph.D.

Professor of Elementary Education, Teachers College, Columbia University. Author: "How to Study and Teaching How to Study"; "Elementary School Standards." Joint Author: Tarr & McMurry Geographies; "Method of the Recitation."

Pictures furnish material for thought as does the printed page, and they even rival print in that task. How extensively, and often exclusively, do advertisers rely upon pictures for attracting customers! Cartoonists compete with the most gifted writers in newspapers and magazines; and the great picture galleries of the world quite possibly exert as much influence as the great libraries.

One danger of the printed page is that it may lead to no imaging. A little girl who was studying a description in geography of a river valley was asked what she saw, as she reproduced the facts. She replied that she saw the page containing the words. There is always this danger in the use of books.

But pictures — particularly those providing for the third dimension, as do the stereographs — tend to bring one into the presence of the thing itself. A certain pupil who was looking at a stereograph of a deep gorge unconsciously stepped back a few feet to avoid falling in — so actual seemed the danger. Such pictures guarantee reality. Since excellence in method of presenting ideas is largely measured by the vividness with which situations are thus visualized, these pictures possess a decided superiority over textbooks.

This very superiority leads to a serious fault. Since pictures can do so much for us, they are often relied upon to do all; to convey their facts directly on sight, without any effort on our part in the way of studying or thinking. With this idea in mind many persons give only a few seconds at most to *the observation of any picture*; and in consequence they

aids that call forth no effort necessarily br

in the actual presence of mountain scenery
one Canyon, or a large factory, one's mine
tively, if one sees much. One must anal
, must raise questions and seek their answe
other words, must really study, if one get
Books and pictures, being farther remove
equire still more effort. The best thoughts i
n print; they are suggested by the print, provi
mind is awake. So the principal thoughts
icture do not come immediately into mind; the
ught. Intelligent visitors to picture galleries
alf hour before a painting, not merely starin
ing it; and they repeat the process day after
if not all, of these six hundred stereograp
gems. Many of the ideas that they reveal li
ce, and in their study some of the spirit of t
necessary.
the first place, these pictures should not be ex
y. Each pupil should follow his own rate,
f others, for thoughtful observation is otl
. This suggestion emphasizes method one —
lowing — as the plan most desirable among tl
nentioned.
should not look for " just anything " in the

for their answers. The conception of such questions is not easy work; it is real study, calling for some initiative; but their nature largely determines the value of the study; they are the source of motive for observation, and the basis for organization of details; and as much time may well be spent in finding the questions as in finding their answers.

3. The questions having been fixed upon, the more things one can discover that bear upon them the better; for this number determines the thoroughness of the knowledge, and the force with which impressions are driven home. On the other hand, facts unrelated to such questions should be disregarded, because any mention of them would be only an interruption. Proper study of these pictures will be distinguished almost as much by what is omitted, as by what is included.

4. One should study a picture — or read a book — not merely to know what is there, but rather to communicate the results to others, either orally or in writing, or otherwise to use them. By this provision a sense of what is valuable is kept alive and exercised, and one is much more discriminating, in consequence. Unless one is willing to be a passive collector of facts, their utilization must be held in mind from the beginning. This suggestion emphasizes the importance of method four in the article on methods, as a supplement to method one.

NOTE: — It is not generally known that Dr. Oliver Wendell Holmes perfected the stereoscope and designed the present form of this popular and effective instrument. It has seemed, therefore, appropriate that we should give on the following page a quotation from the writings of Dr. Holmes. The statements appeared in a series of magazine articles on the stereoscope and stereograph published in the *Atlantic Monthly*. They are copyrighted and are reproduced through the courtesy of Houghton, Mifflin & Co.

THE PUBLISHERS.

g truth. . . .
ee something with the second eye which we
the first; in other words, the two eyes see d
f the same thing, for the obvious reason that th
its two or three inches apart. By means of th
views of an object, the mind, as it were, *feels* ı
an idea of its solidity. . . .
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for the stereoscope, is to be the card of intro
all mankind acquaintances.

rst effect of looking at a good photograph thro
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its way into the very depths of the picture.

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here is such a frightful amount of detail, that ı
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as the dome of St. Peter's, or the summit o
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of persons or of things.
s one infinite charm of the photographic delir
lly, a perfect photograph is absolutely inexha
re you can find nothing which the artist has n

HOW TO USE THE STEREOGRAPHS AND THE LANTERN SLIDES

Credit for this chapter on methods cannot properly be given to any single educator. It represents the best judgment of several thousand superintendents, principals and teachers who for many years have used the Keystone "600 Set" of stereographs and lantern slides in daily classroom instruction. To these and other educational leaders is due the credit for the development of these effective methods.

LESSON ASSIGNMENT

Every lesson normally falls into four parts (1) the assignment by the teacher; (2) the preparation of the assignment by the pupils; (3) the class recitation by the pupils, directed by the teacher; and (4) the review, covering a series of lessons.

The lesson assignment should be definite. Mention should not only be made of the exact amount of text to be read, but there should also be just enough said to whet the natural curiosity of the pupils. Here is where the stereographs function first. With the assignment there will also be announced that certain stereographs, illustrating the topic in question, will be accessible to all pupils as a part of their lesson preparation. This at once stimulates interest, and thus the teacher's preliminary work is made easy.

STEREOGRAPHS FOR THE PREPARATION

Stereographs play their direct part in the preparation of the lesson assignment. In this they are well-nigh indispensable. The preparation of the lesson is individual work on the pupil's part. If he is forced to rely wholly on his textual reading, many of his conceptions of fundamental facts are sure to be hazy. If the stereographs did no more than correct misconceptions through visualization of the objects discussed, their place in the school would be secure. But they serve a

far wider purpose; they help interpret the text to the pupil; they constantly add *new* ideas of a definite character; they create a genuine enthusiasm for the whole lesson and become a vital stimulant to thought development. *The correct time to employ the stereographs is at the point when pupils are groping for concrete conceptions of the topic studied.* And this is during the preparation of the lesson.

SPECIFIC METHODS

Various possible methods of successfully operating the stereographs immediately suggest themselves. The one best suited to any school will be determined by class room condition. But actual use on the part of expert teachers, covering a great number of years, has demonstrated that the best results may be obtained by the following methods:

REFERENCE TABLE PLAN

Method One — Reference Table Plan. At the time the lesson is assigned place the selected stereographs, with stereoscopes, on a table convenient of access to the pupils. The stereographs should be limited in number, and carefully chosen to supplement the textual assignment. Let the members of the class have free access to the stereographs during the study periods throughout the day, or the teacher may indicate the order in which groups of two to six pupils may study the stereographs. Let it be understood that the descriptions on the back are an integral part of their lesson assignment. When the stereographs are left on the reference table for a day or more this method provides for a careful study of each view on the part of every pupil. By this plan, each child will study the picture for himself, and will fix his images because observational time has been provided.

SEAT STUDY

Method Two — Seat Study. The selected views are placed in stereographs and handed the first pupil in the outside row, *during the study period.* He observes each stereograph in turn and passes the stereographs in order across the aisle to the first pupil in the second row. Each view thus travels to

the first pupils in every row, and then back to the second pupils in each row and so on to the whole class. Two or more stereographs illustrating the days' topics may thus be studied during the regular study period in a systematic, thorough way. Each pupil gives to this study only the minute or two that is needed to fix his images and read the descriptive text for each stereograph.

[Note — A modification of this plan is to have a pupil read the text to the class before the stereograph is passed. It permits the handling of the scenes more rapidly, but where possible it is best to have each pupil read the text as the scene is studied.]

DESCRIPTIONS VALUABLE

The descriptions on the backs of the views are written simply. The vocabulary is simple and the sentences are short. These articles were carefully prepared so that the pupils as low as the fourth grade can readily handle them. As an additional help the difficult proper words which the pupil needs to know are marked diacritically. It is quite desirable that the pupils have an opportunity to study this text in connection with the examination of the stereograph.

RECITATION-STUDY

Method Three — Recitation-Study. Where school plans do not give study period time for methods One or Two, the Recitation-Study plan gives results that are really wonderful. By this method two or three minutes of the recitation period are used for an intensive study of the stereograph. A pupil places the stereograph in a stereoscope and passes down the rows of seats, permitting each pupil to observe the scene for three or four seconds. At the same time the pupil gives loudly so all the class may hear a statement of facts which he has prepared from a previous study of the scene and its description. In this way both the scene and the explanation may be given to a class of 40 pupils in from two to three minutes. If five minutes can be spared it can be used advantageously and permit a longer observation time for each pupil, but two or three minutes will answer. Some may doubt that a scene rich in teaching content can be presented effectively in the time

ct, and each is eager to tell what he has seen in hi
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identally, with the new freedom born of visual
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: for yourself. Select, for example, the scenes
dustry from the "600 Set" and let him study the
vely. He can tell you or write for you the St
ır How We Get Our Bread, and dozens of other
ıjects equally vital to his future activities.

ORAL AND WRITTEN COMPOSITION

hed Four — Oral or Written Composition

ently and in correct English is an essential part of his daily work. Ordinarily the preparation with the stereograph by Methods One, Two, or Three will serve equally well for the special drill in Oral or Written Composition. This is especially true where all will speak or write upon the same subject. But, oftentimes, the following method may be used with advantage. One stereograph is given to each pupil in the class for careful study for a period of from five to eight minutes. Each pupil studies his stereograph with the naked eye and reads carefully the text on the back. During this study period a stereoscope is supplied to each pupil in an outside row. These pupils, for a period of about one minute, examine their stereographs through the stereoscopes. Each stereograph is taken from the stereoscope and retained, while the stereoscope only is passed across the aisle to the next pupil and to the next until the stereoscope has crossed the room. In this way each pupil in the room has five minutes or more for a detailed study of the scene assigned him, and an additional minute for the study of the same scene through the stereoscope. He thus gets a wealth of information and an intensely real impression of the subject upon which he is to speak or write.

THE LOWER GRADES

Properly selected stereographs may be used with much satisfaction and success by the teacher to make observation lesson and story telling vitally real even down to the first grade and kindergarten. They are especially helpful in the first steps in elementary geography, when the child needs concrete concepts of mountains, rivers, lakes, hills, etc. They may assist greatly in interpreting the conditions emphasized in home geography, they create interest in food and clothing, peoples and customs of home and foreign lands and other topics suitable to these grades.

LANTERN SLIDES FOR REVIEW

When a definite section of the text has been covered in a series of daily lessons, there comes the review of the larger units of subject matter. The object of any review is two-fold; it gives a rounded survey of the material previously studied in detail; and it corrects erroneous impressions or misunderstand-

ings. In short, it is a re-view. Here is where the lantern slides work effectively. Select slides duplicating the stereographs which have been used in the detailed study and throw them on the screen. Let the pupils explain their connection with the review topics — interpret the slides to their fellows. In this way the review is not only comprehensive and corrective, but is a real re-view, a re-visualization and fixing of images. Incidentally, the deadliness of the ordinary review lesson is eliminated by the introduction of a new aspect of old materials. Scenes previously made familiar to each individual are now shown to the class collectively, and in a new dress. The lantern slide review clinches essential facts previously studied, clarifies impressions formed and insures correct conceptions through a free interchange of class opinion. This review offers an exceptionally fine opportunity for a drill in oral composition.

COMBINATION STEREOGRAPHS AND SLIDES

Since *any* form of visual instruction gives results that are strikingly superior to acquiring knowledge from the printed page, it is not unnatural that the enthusiastic instructor may for a time accept the results from any one form of visual material as the final product, thereby missing the far greater results that may be obtained by a correct combination of materials and methods as outlined above. The lantern slide has an important place in visual instruction methods. Experience thus far has demonstrated that its greatest usefulness is in the class review. The stereograph is peculiarly adapted to and most effective in the individual preparation of the lesson assignment. Here it is *supreme among visual aids. It will more nearly stand alone than any other visual material.* But even the stereograph should be followed by the lantern slide review. This combination of visual materials is the answer to the question every teacher so frequently asks herself: *How can I make my school work vital?*

EDITORIAL BOARD

General Introduction

By Charles W. Eliot, Ph.D.

President-Emeritus of Harvard University

Concreteness in Education

By William C. Bagley, Ph.D.

Director School of Education, University of Illinois, Urbana, Ill. Author: "The Educative Process"; "Class Room Management"; "Craftsmanship in Teaching"; "Educational Values"; "School Discipline." Joint Author: "Human Behavior." Editor: *School and Home.* Joint Editor: *Journal of Educational Psychology.*

How to Study Stereographs and Lantern Slides

By Frank M. McMurry, Ph.D.

Professor of Elementary Education, Teachers College, Columbia University. Author: "How to Study and Teaching How to Study"; "Elementary School Standards." Joint Author: Tarr & McMurry Geographies; "Method of the Recitation."

GEOGRAPHY

INTRODUCTION

By Charles T. McFarlane, Pd.D.

Controller and Professor of Geography, Teachers College, Columbia University. Joint Author: Brigham & McFarlane, "Essentials of Geography."

1. Geographical Classification and Title List

By D. C. Ridgley, A.B.

Professor of Geography, Illinois State Normal University, Normal, Ill. Author: "Important Topics in Geography"; "Home Geography"

In this chapter is presented the title list of the 600 stereographs and lantern slides which actual classroom use has demonstrated as the most effective for purposes of instruction. They are classified geographically by continents and political divisions and give 600 references to the important countries of the world. (See page 3.)

2. People of All Lands (Racial Geography)

By Mark Jefferson, A.M.

Professor of Geography, Michigan State Normal College, Ypsilanti, Mich. Author of "Teachers' Geography"; "Materials for the Geography of Michigan"; "Exercises on the Topographic Map." Associate Editor: *Journal of Geography*.

153 stereographs and slides to which 154 references are made, illustrating the distinguishing features of the great races of mankind and their branches and to show the racial characteristics and development of the great nations. At the same time this classification, by showing homes, clothing, use of implements and industrial processes, necessarily differentiates peoples according to their civilization. (See page 31.)

3. Production and Manufacturing (Industrial Geography)

By Charles Redway Dryer, M.A., M.D.

Geographer, Fort Wayne, Ind. Formerly Professor of Geography and Geology, Indiana State Normal School, Terre Haute, Ind. Author: "Studies in Indiana Geography"; "Lessons in Physical Geography"; "Geography, Physical, Economic and Regional"; "Natural Economic Geography."

437 stereographs and slides with 968 references showing our industrial resources and equipment. The classification is divided into two main parts, the first of which deals with industries as units under the subheads, Foods, Clothing, Mining and Mineral Industries, Lumbering and Forest Products, and Irrigation. In the second part the process is the fundamental idea presented under the headings, Collective, Productive, Constructive and Distributive Industries. (See page 45.)

4. Transportation

By Emery R. Johnson, Ph.D., Sc.D.

Professor of Transportation and Commerce, University of Pennsylvania. Author: "Inland Waterways, Their Relation to Transportation," 1893; "American Railway Transportation," 1903; "Ocean and Inland Water Transportation," 1906; "Elements of Transportation," 1909; "Railroad Traffic and Rates," 1911; "Panama Canal Traffic and Tolls," 1912; "Measurement of Vessels for the Panama Canal," 1913; "History of Domestic and Foreign Commerce of the United States," 2 vols., 1915.

The classification of Transportation presents 345 stereographs and slides with 399 references thereto. It makes plain the universal dependence of modern life upon means of trans-

portation. Every method of carrying, both primitive and modern, is illustrated. Human carriers, beasts of burden, carts, wagons, railroad trains, water craft from the Chinese junk to the great ocean liner or submarine and airplanes are shown so classified that the part each one takes in the world's work is easily seen. (See page 73.)

5. Markets and Marketing

By J. Paul Goode, Ph.D.

Professor of Geography, University of Chicago. Specialist in Economic Geography and Cartography. Associate Editor *Journal of Geography*. Lecturer and writer on "Commercial and Economic Geography." Author of important series of wall maps for schools and colleges.

156 stereographs and slides showing the ever increasing idea which the word "market" may be made to convey. In this classification are shown, first, the Primitive Markets where trade is direct. Then the Great Market Centers where the buying and selling is done for a large territory are seen. Next come the Production Centers where commodities are handled in such quantities as to establish a World Market, and last Regions with a Large Demand for a certain commodity are shown to be Markets for that commodity. (See page 87.)

6. Natural Forms and Forces (Physical Geography)

By Wallace W. Atwood, Ph.D.

Professor of Physiography, Harvard University. Formerly Associate Professor of Geology and Physiography, University of Chicago. Geologist, U. S. Geological Survey. Author of "Interpretation of Topographic Maps"; "Geological and Mineral Resources of the Alaskan Peninsula"; "Physical Geography of the Devil's Lake Region," etc.

During past ages the surface of the earth has been changed by natural forces including the atmosphere, ground and surface water, snow, and ice and internal forces such as heat and pressure, and by organic agencies including man. These forces have produced the mountains, hills and volcanoes, the lakes and rivers, the capes, peninsulas and islands — all these actions and results are illustrated in this classification of 218 stereographs and slides with 372 references. (See page 97.)

7. Zones and Their Effect on Life. Elevation of Land (Altitude and Its Effect on Life)

By Robert De C. Ward, A.M.

Professor of Climatology, Harvard University. Author of "Practical Exercises in Elementary Meteorology"; "Climate, Considered Especially in Relation to Man." Translator of Julius Hann's "Handbuch der Klimatologie," Vol 1, 2nd ed. Associate Editor *Journal of Geography.*

185 stereographs and slides with 197 references presenting the effect of climate (whether resulting from position or altitude) upon the general appearance of a country, upon vegetation, crops, occupations and dwellings, are the basis of this classification. Climatic controls over the earth's surface and its flora, and man's mode of life under the limitations imposed by climate, are well illustrated in the views selected. (See page 109.)

8. Geography by Nations (Political Geography)

By E. M. Lehnerts, A.M.

Assistant Professor of Geography and Geology, University of Minnesota. Associate Editor *Journal of Geography*

A classification of 254 stereographs and slides with 382 references, showing the extent and distribution of each great nation's possessions, something of the geographic factors in each nation's development and the extent of governmental freedom existing throughout the world. (See page 121.)

9. Earth Neighbors

By James F. Chamberlain, Ed.B., S.B.

Professor of Geography, State Normal School, Los Angeles, Cal. Associate Editor *Journal of Geography.* Author: "Field and Laboratory Exercises in Physical Geography"; "How We Are Fed"; "How We Are Clothed"; "How We Are Sheltered"; "How We Travel"; "North America"; "Europe"; "Asia"; "South America"; "Africa."

96 stereographs and slides, with 99 references, dealing not only with telescopic photographs of the sun, moon, planets, comets, etc., but with those scenes upon the earth which show the influences of these earth neighbors upon human affairs. (See page 141.)

HISTORY AND CIVICS

INTRODUCTION

By Albert Bushnell Hart, Ph.D., Litt.D., LL.D.

Professor of Government in Harvard University

10. Foreign Beginnings of American History

By Hutton Webster, Ph.D.

Professor in the University of Nebraska. Author of "Ancient History"; "Early European History"; "Readings in Ancient History"; and "Readings in Medieval and Modern History"

This classification of 74 stereographs and slides has been made with the purpose of setting forth the foreign background of American history; to trace its people with their habits and customs to their sources in order that American History may not be isolated but may be seen in its relation to the rest of the world's story. (See page 151.)

11. Foundations of the American Nation

By Albert Bushnell Hart, Ph.D., Litt.D., LL.D.

Professor of Government in Harvard University. Author of "Essentials of American History"; "Formation of the Union"; "Guide to the Study and Reading of American History"; "The Monroe Doctrine"; "National Ideas Historically Traced"; "New American History"; "Salmon P. Chase"; "School History of the United States"; "Slavery and Abolition"; "Southern South," etc. Editor of the *American Nation*, "Cyclopedia of American Government"; "American Citizen Series"; "Epochs of American History"; "American History Told by Contemporaries"; "American Patriots and Statesmen," etc.

92 stereographs and slides with 123 references. "The purpose of this classification is to introduce the pupil to the formative period of American history, extending from the earliest discoveries by Europeans to the organization of the government under the constitution of 1787. This naturally includes the physical background, the face of the country, then the original inhabitants and finally some of the scenes of their colonial and revolutionary history." (See page 159.)

12. The Development of Our Nation

By H. Morse Stephens, M.A., Litt.D.

Professor of History, University of California, Berkeley, Cal. Author: "History of the French Revolution"; "The Story of Portugal"; "Revolutionary Europe"; "Colonial Civil Service"

204 stereographs and slides with 310 references "to make young people realize that their country has in time past been carried on by people like themselves; to make them familiar with social and economic life of the past as well as with political events and let them feel that constitutions, presidents, wars, battles, treaties are only the external parts. They are of value only so far as they illustrate the great theme of the nation's growth, the nation's mind and the nation's standards." (See page 165.)

13. America of Today — Our Resources — Preparedness

By Jacques W. Redway, F.R.G.S.

Author: "Manual of Geography." Joint Author: "Natural Geographies"; Commercial Geography"; "Elementary Physical Geography"; Redway School History"; "Book of the United States"

This classification presents 169 stereographs and slides, with 202 references which "will lead children to find causes and results of political life in economic conditions, and to understand that history is not the action of leaders but of the mass of people." This classification compares our resources with that of other countries. (See page 179.)

14. Government

By Arthur Norman Holcombe, Ph.D.

Assistant Professor of Government in Harvard University. Author of "Public Ownership of Telephones on the Continent of Europe"; "State Government in the United States"

This classification of 287 stereographs and slides with 518 references aims to present the topic of government from the constitutional and institutional view point. The operations of government in many situations and under many conditions are noted. One will not fail to note the helpful way in which this chapter and the following one on Community Civics supplement each other. (See page 191.)

15. Community Civics

By Arthur William Dunn, A.M.

Specialist in Civic Education, United States Bureau of Education, Washington, D. C. Author of "Community Civics"

299 stereographs and slides with 806 references. "The aim of community civics is to help the child to know his community, not merely a lot of facts about it, but the meaning of his community life, what it does for him and how it does it; what the community has a right to expect from him and how he may fulfill his obligation, meanwhile cultivating in him the essential qualities and habits of good citizenship." (See page 203.)

16. The Cities of the World

By John Nolen, A.M., Sc.D.

City Planner, Landscape Architect, Boston, Mass.

342 stereographs and slides with 1024 references, showing the wonderful urban development of the modern world. And because this is new, and the city is one of the main problems of modern democratic society, this classification analyzes cities in their growth and plans, their size and dominant functions. Its purpose is to create intelligent control of civic conditions instead of passive acceptance. (See page 219.)

ENGLISH

INTRODUCTION

By Franklin Thomas Baker, Ph.D.

Professor of English Language and Literature, Teachers College, Columbia University

17. Literary Subjects and Settings

By Franklin Thomas Baker, Ph.D.

Professor of English Language and Literature, Teachers College, Columbia University

255 stereographs and slides with 448 references. The editor, following the idea that the trend of modern education has been steadily away from interest in mere words to interest in

the ideas and things which words denote, has selected those views which illustrate the literature most commonly presented to pupils. The classification emphasizes the fact that knowledge obtained by the senses, especially sight, is the basis for both the creation and real appreciation of literary merit. (See page 245.)

18. English Composition

By James Fleming Hosic, Ph.M.

Head of English Dept. in Chicago Normal School. Editor of *English Journal*. Secretary, The National Council of Teachers of English. Joint Author: "Practical English for High Schools"; "A Composition Grammar"

This classification of 469 stereographs with 1008 references is made to assist growth in power of English expression. "Children in elementary grades cannot speak nor write effectively when burdened with the consciousness of form." What they need is a real audience and something definite to say. The Keystone plan fills these needs. The editor has grouped together a series of possibilities for interesting composition work, oral and written. The classification includes a variety of business letters concerning real business. (See page 259.)

19. Spelling

By William Estabrook Chancellor, A.M.

Head Dept. of Economics, Politics and Sociology, College of Wooster (Ohio). Financial Writer. Author of "Evening School Series"; "Graded City Spellers"; "How to Teach Spelling"; "Spelling; Its Principles, Methods and Devices"; "Our Schools: Their Administration and Supervision."

The editor has prepared this classification of 482 stereographs and slides with 895 references to show how spelling may be converted from a mechanical process to a living one which will train in initiative ingenuity and accuracy. Suggestions are made for each grade from the third to the eighth. (See page 269.)

20. Biography

By Charles H. McCarthy, Ph.D.

Dean of the School of Philosophy, and Knights of Columbus Professor of American History, Catholic University of America, Washington, D. C. Author: "Lincoln's Plan of Reconstruction"; "Civil Government in the United States"; "Columbus and His Predecessors."

550 stereographs and slides with 2648 references to the people who have impressed their lives most strongly on the progress of the race.

Listed alphabetically — the Old and New World separately — this classification is replete with useful information for the teacher or student of History and Literature. (See page 279.)

AGRICULTURE

INTRODUCTION

By Charles F. Curtiss, M.S.A., D.S.

Dean Division of Agriculture and Director of the Experiment Station, Iowa State College, Ames, Iowa

21. Soils

By Alfred Vivian, Ph.G.

Dean College of Agriculture, Ohio State University, Columbus, Ohio. President Board of Education for State of Ohio

68 stereographs and slides with 76 references, which illustrate the formation of soils, the kinds and something of their management. (See page 311.)

22. Farm Crops

By W. M. Jardine, B.S.A., LL.D.

Dean of the Division of Agriculture and Director of the Agricultural Experiment Station, Kansas State Agricultural College, Manhattan, Kan.

78 stereographs and slides with 99 references to show what crops come from the farm and how they are raised. (See page 319.)

23. Garden, Orchard and Woodlot

By R. L. Watts, M.S.

Professor of Horticulture, Dean Department of Agriculture and Director of the Experiment Station, State Agricultural College, State College, Pa.

This selection of 48 stereographs and slides with 49 references enables the editor to present many helpful items of instruction dealing with the garden products, orcharding and the timber supply of the woodlot. There is included an interesting classification on Landscape Gardening. (See page 327.)

24. Animal Husbandry

By W. A. Cochel, A.B., B.S.

Professor of Animal Husbandry, Kansas State Agricultural College, Manhattan, Kan.

36 selected stereographs and slides with 37 references illustrate the value of livestock as a dominant factor in agriculture. From primitive herding to the highly complex business of the modern feed lot the important items in animal husbandry are shown. (See page 335.)

25. Farm Management — Farm Machinery

By Martin Luther Fisher, M.S.

Professor of Crop Production and Farm Management and in charge Department of Agronomy, Purdue University, Lafayette, Ind.

Assisted by Wm. Aitkenhead, A.M., M.E.

Associate Professor of Farm Mechanics, Purdue University, Lafayette, Ind.

This classification of 96 stereographs and slides with 238 references analyzes and illustrates "the handling of the farm and its equipment so as to produce farm products with the greatest profit and still maintain or even increase the productiveness of the soil." (See page 341.)

26. Farm Home and Farm Life

By A. E. Winship, Litt.D., LL.D.

Lecturer, Editor *Journal of Education*, Boston. Author: "The Shop"; "Life of Horace Mann"; "Great American Educators"; "Jukes-Edwards"; "Our Boys"

124 stereographs and slides with 215 references presenting the farm as a home rather than as a business. They show the farm home, the farmer's independence, the scientific knowledge needed in his work, the methods of working and the social side of country life. (See page 355.)

NATURE STUDY

INTRODUCTION

By Ernest Thompson Seton

Naturalist and Author, Greenwich, Conn. Founder and Chief Woodcraft League

27. Plants and Plant Associations

By John M. Coulter, Ph.D.

Professor and Head Dept. of Botany, University of Chicago

Assisted by George D. Fuller, Ph.D.

Instructor in Plant Ecology, University of Chicago

This classification of 184 stereographs and slides with 358 references deals with plants, their kinds, their relation to each other, and the factors which determine what plants can live on a given area. (See page 365.)

28. Animals

By Ernest Thompson Seton

Naturalist and Author, Greenwich, Conn. Founder and Chief Woodcraft League

143 stereographs and slides with 156 references selected to show a great range of animals both domestic and wild with something of their natures, habits and their uses to man. (See page 377.)

29. Out Door Life

Boy Scouts, Campfire Girls, Woodcraft League

By Daniel Carter Beard ("Dan Beard")

Honorary Vice-President, and National Scout Commissioner, Boy Scouts of America, Flushing, N. Y.

356 stereographs and slides, with 369 references which carry us on hikes anywhere on the face of the globe. This series encourages outdoor life and at the same time shows how the imagination and Keystone Views together enable us to travel over the world, "to hit the trail back through history." The classification suggests many themes and lends itself especially as an aid to English Composition. (See page 387.)

30. Vocational Guidance

By Meyer Bloomfield, B.A.

Director of the Vocational Bureau, Boston, Mass. Author: "Vocational Guidance of Youth"; "The School and the Start in Life"; "Youth, School and Vocation"

These 137 stereographs and slides with 178 references bring

the most helpful thought that everything we use and enjoy is the result of our own or some one else's labor, and that to do one's work well means skill, thought, effort and sacrifice. The classification presents the best possible introduction for children to the vital subject of choosing a life career. (See page 393.)

DOMESTIC SCIENCE AND ART

INTRODUCTION

By Martha Van Rensselaer, A.B.

Professor of Home Economics, and Director of Extension Dept. of Home Economics, Cornell University, Ithaca, N. Y. Editor and Author of "Reading Course for Farm Home"

31. INDUSTRIES SUPPLYING THE HOME

By Lorenzo Dow Harvey, Ph.D.

President of Stout Institute, Menominee, Wis. Author: "Practical Arithmetic"; "Essentials of Arithmetic"

This selection of 90 stereographs with 101 references is designed to give the student of Domestic Science and Domestic Art a broad view of the close relationship existing between the home and the great world of industry. (See page 405.)

32. FOOD AND COOKERY

By Edna N. White, B.S.

Head of Dept. of Home Economics and Supervisor of Home Economics Extension Dept. Ohio State University, Columbus, Ohio

Assisted by Lelia McGuire, B.S.

Assistant Professor of Home Economics, Ohio State University, Columbus, Ohio

108 stereographs and slides with 111 references, relating to foods, their values and preparation for use. This classification ably presents the necessity for intelligent use and conservation of foodstuffs. (See page 409.)

33. TEXTILES AND CLOTHING

By Anna M. Cooley, B.S.

Associate Professor of Household Arts Education, Teachers College, Columbia University. Author: "Domestic Art in Woman's Education." Joint Author: "Food and Health"; "Clothing and Health"; "The Home and the Family"; "Shelter and Clothing"; "Foods and Household Management"; "Occupations for Little Fingers."

Assisted by Edith P. Chace, B.S.

Instructor in Household Arts Education, Teachers College, Columbia University

191 stereographs with 239 references showing the origin and manufacture of materials, the uses of the various textiles, industrial occupations connected with their production and the costumes of various countries both ancient and modern. (See page 421.)

34. Household Administration

By Grace Schermerhorn, B.S.

Director of Cooking in the New York City Public Schools. Formerly Assistant Professor of Home Economics, University of Idaho; Director of Practice Teaching in Home Economics, Iowa State College, Ames, Iowa

This classification of 53 stereographs and slides with 60 references aims to tie together the work done in Foods, Clothing and Shelter, dealing with the subject from the point of view of the home maker. (See page 431.)

INDUSTRIAL ARTS

INTRODUCTION

By Charles A. Prosser, Ph.D.

Director Dunwoody Industrial Institute, Minneapolis, Minn. Author: "New Harmony Movement"; "The Organization and Administration of Vocational Education"; "The Meaning of Vocational Education," etc. General Editor "Vocational Educational Series." National Director of Federal Commission on Vocational Education.

35. Industrial Design — Including Architecture

By Raymond P. Ensign

Instructor in Design, Supervisor of Design Classes, Pratt Institute, Brooklyn, N. Y.

These 473 stereographs and slides with 1167 references thereto make a classification which brings a wealth of illustrative material for Manual Training classes in Design. It shows the advantage taken of Natural Forces, Mechanical Powers and Construction, while the second part gives the History of Architecture and Architectural Design and Construction adapted to uses of every kind. (See page 437.)

36. Wood

By George M. Brace, M.A.

Director Manual Training High School, St. Paul, Minn.

147 stereographs and slides with 190 references which illustrate the place which wood occupies in our life. Its growth, cutting, manufacture and uses form the subject matter of the classification. (See page 469.)

37. Metals — Sources and Uses

By Harry S. Bitting

President Williamson Free School of Mechanical Trades, Williamson School, Pa.

111 stereographs and slides with 120 references selected to show the sources, preparation, manufacture and uses of our more important metals. (See page 475.)

38. Concrete, Stone, Brick and Tile

By Charles M. Spofford, S.B.

Hayward Professor of Civil Engineering in Charge of the Department of Civil and Sanitary Engineering of the Massachusetts Institute of Technology and Harvard University. Author: "The Theory of Structures." Member, Fay, Spofford and Thorndike, Consulting Engineers, Boston, Mass.

117 stereographs and slides with 137 references make a classification of interest to the pupil, showing the sources and processes of obtaining and preparing these four great building materials and their uses in modern constructive works. (See page 483.)

39. Local Industries

By Clifford B. Connelley, Sc.D.

Dean School of Applied Industries, Carnegie Institute of Technology, Pittsburg, Pa.

122 stereographs with 145 references selected to show the children the industrial life that goes on about them. The views brought together in this classification will give accurate ideas of the industrial activities of the communities in which they live and make personal adjustment to industry easier and better. (See page 491.)

40. Hygiene — Health Habits

By Michael Vincent O'Shea, B.L.

Professor of Education, University of Wisconsin. Author: "Education as Adjustment"; "Dynamic Factors in Education"; "Linguistic Development and

Education"; "Social Development and Education"; "Every Day Problems in Teaching." Editor-in-chief, "The World Book."

The 72 stereographs and slides with 188 references in this classification are made the basis for stimulating suggestions as to health habits with regard to outdoor life, work, food and drink, hearing, breathing, air and light, fatigue and cleanliness. (See page 501.)

FINE ARTS

INTRODUCTION

By C. Valentine Kirby

Director of Art Education, Pittsburgh Public Schools

41. Drawing — Study of Stereographs and Slides to Show Elements of Art

By Harry W. Jacobs

Director Art Instruction, Public Schools, Buffalo, N. Y.

216 stereographs and slides with 283 references are embodied in this classification to give a practical view point on the subject of perspective and drawing in general. Such subheads as Parallel Perspective, Angular Perspective, Poster Drawing, Pencil, Pen or Charcoal Sketches from Photographs to Develop Technique, and Nature show the range of subjects illustrated. (See page 509.)

42. House Design and Decoration; Costume Design

By Mary J. Quinn

Supervisor of Design, Pratt Institute, Brooklyn, N. Y. Author: "Planning and Furnishing the Home"

Art in the home brings art instruction to a practical application. Houses and furnishings should be studied and children should be taught to judge what is best in a given circumstance. Then, too, the clothes of the people reveal their civilization. They express the manners, the habits of living, the workmanship, the art of the people. (See page 517.)

43. Photography

By C. E. K. Mees, D.Sc.

Director Research Laboratory, Eastman Kodak Company, Rochester, N. Y.

223 stereographs and slides with 271 references which fur-

nish instruction as to composition, perspective, lighting, choice of subject and of view and illustrates thoroughly each point explained. This classification is a splendid introduction to the photographers' art. (See page 543.)

44. Visualized Problems

By John H. Walsh, LL.B., Ph.D.

Associate Superintendent of Schools, The City of New York. Joint Author: "Walsh-Suzzallo Arithmetics." Author: "Mathematics for Grammar Schools" "New Primary Arithmetic"; "New Grammar School Arithmetic"; "Practical Methods in Arithmetic," etc.

This classification of 235 stereographs and slides with 271 references lifts Arithmetic out of abstraction (a position which it too often occupies) into a vital relation with life. By visualizing the premises upon which the problems are based, the study is made both interesting and practical. (See page 557.)

FOR THE LITTLE FOLKS

INTRODUCTION

By William C. Bagley, Ph.D.

Director School of Education, University of Illinois, Urbana, Ill.

45. Children of the World, Including Home Life

By G. A. Mirick, A.M.

Educational Specialist, Cambridge, Mass. Formerly Assistant Commissioner of Education, Supervising Elementary Schools, State of New Jersey. Author: "Home Life Around the World"; "A Grammar for Elementary Schools." Joint Author Kendall and Mirick Series "How to Teach the Fundamental Subjects"; "How to Teach Special Subjects."

A classification of 199 stereographs and slides with 397 references selected from the point of view of the interests and mental capacities of the children who are to use them. Three distinct groupings are indicated so that, regardless of the method of approaching the child favored by the particular school, the material will lend itself readily to the plan used. (See page 581.)

46. Plants and Animals

By Anna Botsford Comstock

Assistant Professor of Nature Study, Cornell University, Ithaca, N. Y.

Editor *Nature Study Review*. Author: "Handbook of Nature Study"; "The Pet Book"; "Ways of the Six-footed." Joint Author: "How to Know the Butterflies."

This classification of 47 stereographs and slides brings to the little people a wealth of material to encourage observation, reflection, appreciation and expression. The views are selected to appeal constantly to the little child's small fund of experience for the purpose of comparison or relating what is known. (See page 595.)

47. Reading

By Charles Madison Curry, A.M.

Professor of Literature in the Indiana State Normal School, Terre Haute, Ind. Author: "Literary Readings." Joint Author: Holton-Curry Readers

Most of the poems and stories used in the readers of the lower grades as well as the best supplementary readers are illustrated in this classification of 484 stereographs with 721 references. (See page 605.)

48. Some Things We Eat: Some Things We Wear

By William M. Gregory

Professor of Geography, School of Education, Cleveland, Ohio

It is the aim of this classification of 129 stereographs and slides with 132 references to make real and vivid the elementary ideas of life; to help children to realize the actual conditions under which we live and how dependent we are upon those people who supply our many needs. (See page 629.)

49. Home Geography

By R. H. Whitbeck, A.B.

Professor of Geography, University of Wisconsin. Editor *Journal of Geography*

This classification of 297 stereographs and slides with 592 references has for its purpose the building up of fundamental concepts by directing observation to the home region. It shows the purpose of the home, the need for home industries for supplying our wants, how materials for clothing are ob-

tained and an understanding of simple industries, of trade, of travel and of transportation. (See page 641.)

50. Travelogue and Lecture Suggestions

By Russell H. Conwell, D.D., LL.D.

Lecturer. President of Temple University, Philadelphia

Oftentimes there is need of a definite listing of lantern slides for a review of regional geography, or other school subject, or when it is desired to use the slides as program material for community meetings to link up the home and the school. This classification of 587 slides with 1489 references will prove very helpful for such use. (See page 653.)

GEOGRAPHY

INTRODUCTION

By Charles T. McFarlane, Pd.D.

Professor of Geography, Teachers College, Columbia University

Geography is "the study of the earth and its products, of man and his industries and of their influence upon each other." For most school children the study of geography is confined to the early years of school life. It comes at a time when children have had but little first hand contact with the world, its people and their industries and before travel has made them familiar with distant places and people or with the products of the earth and the industries growing out of their preparation for use. With the mind of the child open and receptive the intense reality of the stereoscopic presentation insures that the first ideas and concepts formed will be accurate, vivid and permanent.

Failing direct contact with the world that lies beyond a familiar horizon children for the most part learn of it through the medium of the spoken word, the printed page, or its pictured representation. For this reason works on geography and travel are usually well illustrated and many of the most modern text books in geography prepared for the use of children devote a third or more of their space to maps, pictures and other illustrations.

No other subject in the elementary school lends itself so readily to the use of illustrative material or requires more of it, and the text book in geography, with its numerous maps and its hundreds of pictures is always the most attractive of school books.

Not only do teachers make constant use of the pictures in the text-book itself, but they frequently find too few to meet their requirements. The result is that most teachers of geography are constantly collecting from every possible source pictures valuable for study or for class room use during a lesson period. Collections of this sort are valuable in proportion as they show

clearly and accurately the features or process to be taught, and to the degree that some system of classification and cross reference makes each picture available for instant use in connection with any topic where its use might be helpful.

The pictures in the Keystone collection have been carefully chosen because of their teaching quality and because they are susceptible of clear and simple explanation. They are photographs and possess the incomparable advantage of the stereoscopic quality. Upon this latter advantage it is not necessary to dwell beyond emphasizing the fact that in no other kind of picture is there the clearness of perspective — the third dimension — that is found in views of this sort.

The moving picture fails exactly as does the flat photograph to show this perspective quality and is for that very reason often quite misleading in the impression that it gives. Farther the moving picture can not be studied. Even the least inflammable of films can be "held" for only a brief time without being damaged or destroyed. It flickers on and off the screen with no explanation at all or with the briefest of running comment. The opportunity for a quiet and careful study of the picture until its full meaning is understood is altogether lacking. To other disadvantages connected with the use of moving pictures must be added the cost of equipment and the difficulties and dangers connected with showing them.

To a remarkable degree the collection of Keystone views meets the needs of teacher and children. They have been carefully selected for this particular use. They have been grouped and indexed by experts. They may be studied at any time, as often and for as long a time as necessary.

The nine classifications immediately following treat the subject of Geography from various view points and with considerable fullness. The teacher of the lower grades should note especially the classifications "Some Things we Eat; Some Things We Wear" page 629 and "Home Geography" page 641, also the classifications covering the geographic supplementary reading pages 611 and 613.

1. GEOGRAPHICAL CLASSIFICATION AND TITLE LIST

By DOUGLAS C. RIDGLEY, A.B.

PROFESSOR OF GEOGRAPHY, ILLINOIS STATE NORMAL UNIVERSITY, NORMAL, ILL.

This list of 600 views is a complete catalog of the "600 Set" with titles given in full. In classifications following this Geographical Classification, titles are somewhat abbreviated, or entirely changed so that the thought of the Editor of any chapter may be more clearly presented. In every case, however, the stereograph or lantern slide may be quickly identified by the serial number which is always given. If the full title and geographical location is desired, turn to the corresponding number in this list in which the views are numbered consecutively from 1 to 600.

The numbers first given are the serial numbers of the "600 Set," and run from 1 to 600 inclusive. These numbers are followed by *negative numbers*. Such a number serves as an absolute means of identification. The *negative number* is followed by the title of the scene. In all lists following this one the *negative number* is omitted.

Teachers and pupils will be well repaid by making frequent and careful examination of this Geographical Classification in all its main divisions and sub-divisions. A careful study of the exact title and geographical location of the individual scenes will yield excellent results. The serial numbers may be entered on outline maps of the United States and of each continent, in their appropriate places. Maps in the text-book in geography, in atlases, and wall maps, can be used to advantage in locating the scenes accurately. The order of the countries is that usually followed by modern text-books in geography.

An accurate and comprehensive knowledge of the scenes in this Geographical Classification is indispensable to the teacher who expects to make the best use of the numerous lists follow-

ing this one. Such knowledge is to be obtained by using spare moments occasionally in the examination of the stereographs in regular order, learning the details of the scene, its exact title, and by reading the descriptive matter on the backs of the stereographs. Such examination and study will prove a real delight to the instructor. By knowing well the scenes of the list, and the geographical setting of each, the teacher can determine instantly the value of any division of the Classification in relation to the class work which pupils may be pursuing. He is prepared also to select quickly any scene or group of scenes that may bear on any topic that may come incidentally in school work. The topical index at the back of the Teachers' Manual will be found convenient and helpful in linking up these excellent illustrations with the teaching program.

Note especially the careful distribution of these superb stereographs and lantern slides over the entire geographic range. Regardless of the region studied, you will usually find some scene in this "600 Set" that bears directly on the work in hand. This is a distinct achievement which only the remarkable collection of negatives possessed by the Keystone View Company makes possible. *Every state in the United States* is represented. Surely, this is an important consideration to the instructor who would present our great nation in a comprehensive way. The other countries of the world are visualized with a completeness that is as pleasing as it is vital to the best instruction.

NORTH AMERICA

303 stereographs or slides

UNITED STATES AND POSSESSIONS

(Except Asiatic Possessions)

261 stereographs or slides

New England States

24 stereographs or slides

MAINE—*2 stereographs or slides*

1 (12260) Logs from the forest delivered at the stream, Aroostook Co., Me.

2 (14227) Flashlight of wild moose in a Maine forest.

NEW HAMPSHIRE — *1 stereograph or slide*

3 (13709) Quarrying granite — Drilling preparatory to splitting, Concord, N. H.

VERMONT — *2 stereographs or slides*

4 (13701) Marble quarry, Proctor, Vt.— Largest quarry opening in the world.

5 (13706) Chiseling marble — Architectural department, Vermont Marble Company, Proctor, Vt.

MASSACHUSETTS — *15 stereographs or slides*

6 (6172) Old North Church, Boston, Mass.

7 (6180) Quincy Market and Faneuil Hall, Boston, Mass.

8 (11687) Old State House from Court Street, Boston, Mass.

9 (11686) Longfellow's Home, Cambridge, Mass.

10 (11680) Lexington Common, Lexington, Mass.

11 (22188) Skilled workmen cutting leather for high quality shoes, Mass.

12 (22189) Lasting machine shaping shoes in a Massachusetts shoe factory.

13 (20221) Drying codfish in the sun — Gloucester and harbor in the distance, Mass.

14 (22080) Spinning cotton yarn in the great textile mills, Lawrence, Mass.

15 (22082) Copying design on copper rolls for printing cotton cloth, Lawrence, Mass.

16 (22083) General view in large printing room of cotton mills, Lawrence, Mass.

17 (22125) Sorting wool after cleaning and washing, Lawrence, Mass.

18 (22127) Doubling frame in a large woolen mill, Lawrence, Mass.

19 (22068) Cut rags after removing from washing drums — Paper mills, Holyoke, Mass.

20 (22070) Inspecting paper delivered by machine, Holyoke, Mass.

RHODE ISLAND — *1 stereograph or slide*

21 (16773) Skilled workers manufacturing jewelry, Providence, R. I.

CONNECTICUT — *3 stereographs or slides*

22 (20301) Weighing and sorting raw silk skeins — Silk industry (reeled silk), So. Manchester, Conn.

23 (20312) First drawing or straightening of fibers —Silk industry, So. Manchester, Conn.

24 (20316) Spinning — Silk industry, So. Manchester, Conn.

Middle Atlantic States

60 stereographs or slides

NEW YORK — *26 stereographs or slides*

25 (16774) Looking down on New York's Skyscrapers from Woolworth Tower (S. W.) over Battery to Statue of Liberty and Harbor.

26 (14244) Ferry slips and water front of New York City, from the Brooklyn side.
27 (10558) The Great Brooklyn Bridge, New York.
28 (16760) Old and New City Halls and World Building from City Hall Park, New York City.
29 (1009) Wall Street, the financial center, New York.
30 (13773) Up Broadway from Bowling Green, New York.
31 (16751) Many forms of transportation required in large centers of population, New York City.
32 (16752) The Gateway of America — Immigrants landing from barge at Ellis Island, N. Y.
33 (18203) Domestic Art — Dining room and living room.
34 (22165) Conveyor with trays of loaf sugar received from drying kiln, N. Y.
35 (22164) Filling and sewing bags of granulated sugar, New York City.
36 (6299) The cemetery at Sleepy Hollow, N. Y.
37 (13511) Washington's Headquarters at Newburgh on the Hudson, N. Y.
38 (12456) A charming landscape, Hudson River Valley, N. Y.
39 (13508) Looking up the Hudson River from West Point, N. Y.
40 (22260) Folding and ironing linen collars, Troy, N. Y.
41 (22190) General view sewing room — Large shoe factory, Syracuse, N. Y.
42 (22019) Solar method of evaporating salt brine — Collecting, draining and hauling salt, Syracuse, N. Y.
43 (16753) A busy path of commerce in central New York — Four track railway, electric road at right, Erie Canal at extreme left.
44 (16754) Summer spraying in apple orchard, Hilton, N. Y.
45 (16756) Washing 1,000 lbs. of freshly churned butter, Cohocton, N. Y.
46 (16750) Automatic machine for filling and capping bottles of milk.
47 (6708) Picking and loading cantaloupes near Buffalo, N. Y.
48 (6835) Mouth of Erie Canal, Buffalo, N. Y.
49 (149) American Falls, summer view, Niagara Falls, N. Y.
50 (171) The "Beauteous Queen of Cataracts" — American Falls, winter view, Niagara Falls, N. Y.

NEW JERSEY — *10 stereographs or slides*

51 (16730) Picturesque Palisades of the Hudson River, looking north, New Jersey.
52 (16762) The *Vaterland* — the largest ship in the world (1917) — and other German ships seized when war was declared April, 1917, Hoboken, N. J.
53 (22110) Drawing warp for weaving silk cloth in extensive silk mills at Paterson, N. J.
54 (22111) Weaving room in the famous silk mills at Paterson, N. J.

55 (22112) Machine weaving dozens of fine taffeta silk ribbons, Paterson, N. J.
56 (16717) 1500 hens (White Leghorn) in laying house — Corning Egg Farm, Bound Brook, New Jersey.
57 (16749) Milking scene in modern dairy, Plainsboro, New Jersey.
58 (22096) Firing tableware in the noted pottery center, Trenton, N. J.
59 (22097) Artists decorating porcelain ware, Trenton, N. J.
60 (1007) In the surf, Atlantic City, N. J.

PENNSYLVANIA — *24 stereographs or slides*

61 (6342) Confluence of the Allegheny and Monongahela Rivers forming the Ohio River, Pittsburgh, Pa.
62 (6322) Plant of the blast furnace, Pittsburgh, Pa.
63 (6523) Modern pig iron machine at rest, Pittsburgh, Pa.
64 (6531) Emptying cooled pig iron from molds into car, pig iron machine, Pittsburgh, Pa.
65 (6414) Filling molds with steel, Pittsburgh, Pa.
66 (6420) Steel ingot on the "table" of the "blooming" mill, Steel Works, Pittsburgh, Pa.
67 (6421) Red-hot steel beam from rolling process being cut into lengths by buzz saw, Steel Works, Pittsburgh, Pa.
68 (6365) General view of ovens — Loading coke into the cars, Connellsville, Pa.
69 (20058) Filling shell with nitro-glycerine, preparatory to shooting the well — Oil field in Pennsylvania.
70 (20352) Shooting well with eighty quarts of nitro-glycerine. Oil field, Pennsylvania.
71 (16729) Wagon used to haul ammunition to Admiral Perry on Lake Erie (1813) — "prairie schooner" type — Crawford County, Pa.
72 (11404) A June carnival — Dancing around the daisy pole, Crawford County, Penn'a.
73 (195) Culp's Hill, Gettysburg, Pa.
74 (20048) Stripping coal at Hazelton, Pa.
75 (20049) Miners going into the slope, Hazelton, Pa.
76 (7052) Miner drilling and laborer loading "black diamonds" in the rough, anthracite mining, Scranton, Pa.
77 (7057) Loading cage with car of coal at bottom of shaft, Scranton, Pa.
78 (7064) Tandem automatic slate picker, Scranton, Pa.
79 (13204) Shipping coal — Coal breaker in background, Ashley, Pa.
80 (9648) The Old Liberty Bell, Independence Hall, Philadelphia, Pa.
81 (22128) Spinning room, winding bobbins with woolen yarn for weaving, Philadelphia, Pa.
82 (7090) General view of the erecting shop, Baldwin Locomotive Works, Philadelphia, Pa.

83 (16761) School gardens as a practical educational method — Showing Boy Scouts and Camp Fire Girls, Philadelphia, Pa.
84 (22291) Coining presses, Government Mint, Philadelphia, Pa.

South Atlantic States

27 stereographs or slides

DELAWARE — *1 stereograph or slide*
85 (6952) Gathering peaches, Delaware.

MARYLAND — *1 stereograph or slide*
86 (6881) "Shucking" oysters, oyster house, Baltimore, Md.

DIST. OF COLUMBIA — *9 stereographs or slides*
87 (224) The Capitol, Washington, D. C.
88 (16770) Pres. Woodrow Wilson, reading message to joint session of House and Senate, Congressional Chamber, Washington, D. C.
89 (16763) Supreme Court Room, in the Capitol, Washington, D. C.
90 (895) From War, State and Navy Building — White House, Treasury, Pennsylvania Ave. and the Capitol, Washington, D. C.
91 (8025) The White House, Washington, D. C.
92 (16768) The Cabinet Room, Executive Annex to White House, Washington, D. C.
93 (16769) From Washington Monument east to Capitol over Agricultural Dept. grounds, Washington, D. C.
94 (22290) Making paper money, Bureau of Printing and Engraving, Washington, D. C.
95 (8046) Congressional Library, Washington, D. C.

VIRGINIA — *5 stereographs or slides*
96 (8038) Washington's old home, Mt. Vernon, Va.
97 (20197) A mountain of oyster shells to be placed as bedding for young oysters, Hampton, Va.
98 (14196) Pocahontas pleading for the life of John Smith — Enacted by the survivors of the Pamunkey Indian Tribe at the Jamestown Exposition — Opening Day, April 26, 1907.
99 (14219) Some operations of the Life Saving Corps — Jamestown Exposition.
100 (14158) Great warships in Hampton Roads, Va.

WEST VIRGINIA — *1 stereograph or slide*
101 (184) Harper's Ferry, West Virginia.

NORTH CAROLINA — *2 stereographs or slides*
102 (6309) Overlooking the Blue Ridge Mountains from Mt. Toxaway, N. C.
103 (6208) Burning charcoal, mountains in western North Carolina.

SOUTH CAROLINA — *2 stereographs or slides*

104 (20010) Flooding the rice fields, South Carolina.
105 (13751) Hoeing rice, South Carolina.

GEORGIA — *2 stereographs or slides*

106 (6194) Along the wharf of Savannah River, Savannah, Ga.
107 (13747) A turpentine farm — Dippers and chippers at work, Savannah, Ga.

FLORIDA — *4 stereographs or slides*

108 (13740) Harvesting Indian River pineapples, Florida.
109 (314) Old Slave Market, St. Augustine, Fla.
110 (13749) Alligator Joe's battle with a wounded 'gator, Palm Beach, Fla.
111 (9175) Sponge market, Key West Harbor, Fla.

South Central States

16 stereographs or slides

KENTUCKY — *2 stereographs or slides*

112 (20092) Tobacco field in Kentucky.
113 (16741) Cabin in which Abraham Lincoln was born, Hodgensville, Ky.

TENNESSEE — *2 stereographs or slides*

114 (6923) Lookout Inn, Lookout Mountain, from where seven states can be seen, Tenn.
115 (16738) Mining phosphate and loading cars near Columbia, Tenn.

ALABAMA — *1 stereograph or slide*

116 (16737) Steel furnace in Alabama's great iron center, Birmingham, Ala.

MISSISSIPPI — *1 stereograph or slide*

117 (9506) Picking cotton on a Mississippi plantation.

ARKANSAS — *1 stereograph or slide*

118 (16771) Harvesting peanuts, Marianna, Arkansas.

LOUISIANA — *2 stereographs or slides*

119 (12479) Cotton! Cotton! Cotton! Levee, New Orleans, La.
120 (16757) In the Mississippi Delta at head of passes, north from Pilot's Tower to Cubit's Gap, La.

OKLAHOMA — *1 stereograph or slide*

121 (16727) A metropolitan view — Looking north from the Colcord Bldg., over the City of Oklahoma, Okla.

TEXAS — *6 stereographs or slides*

122 (20054) Spindle Top — An important oil region near Beaumont, Texas.

123 (20354) Crude oil stills and can factory, Port Arthur, Texas.
124 (9508) Awaiting their turn at the cotton gin, Greenville, Texas.
125 (20109) Cotton gin, Greenville, Texas.
126 (16579) General view of the Alamo Plaza, San Antonio, Texas.
127 (13756) "Making a drive"—on the Paloduro Ranch, Paloduro, Texas.

North Central States

59 stereographs or slides

OHIO—*8 stereographs or slides*

128 (6697) A comprehensive view of unloaders at work on the ore docks, Conneaut, Ohio.
129 (6705) A trainload of coal for Lake Superior consumption, Conneaut, Ohio.
130 (13665) Tapping a sugar-maple tree, Portage County, Ohio.
131 (22054) Many forms of crude rubber, Akron, Ohio.
132 (22058) Building up an automobile tire in rubber plant, Akron, Ohio.
133 (22060) An interesting scene in the manufacture of rubber boots and shoes, Akron, Ohio.
134 (22001) Method of placing material in furnace, plate glass works, Rossford, Ohio.
135 (22009) Inspecting plate glass after grinding, Rossford, Ohio.

INDIANA—*3 stereographs or slides*

136 (16712) Modern methods of corn harvesting—Cutter and binder at work on an Indiana farm.
137 (16755) "When the frost is on the pun'kin and the fodder's in the shock"—Indiana.
138 (21576) A champion team of Percheron draft horses at work on an Indiana stock farm.

ILLINOIS—*10 stereographs or slides*

139 (2337) In the heart of the great shopping center, State Street, Chicago.
140 (20250) The world's greatest live stock market, Union Stock Yards, Chicago, Ill.
141 (20252) The last process in dressing beef—Washing with boiling water, Chicago, Ill.
142 (20256) Splitting backbones and final inspection of hogs before placing them in the refrigerator rooms, Chicago, Ill.
143 (20257) Trimming and skinning hams before pickling, in preparation for the market, Chicago, Ill.
144 (20259) Making link sausages with the aid of machines which stuff ten feet per second, Chicago, Ill.
145 (18341) Shearing sheep with power driven shears, Kirkland, Ill.
146 (18335) Marshall Joffre, Viviani, Chocheprat and Fabry—French War Commission (1917)—with Gov. Lowden and State officials at Tomb of Lincoln, Springfield, Ill.

147 (6399) Loading oats in the field, Illinois.
148 (20118) Building dikes to protect the city from the flood, East St. Louis, Ill.

MICHIGAN — *10 stereographs or slides*

149 (16716) Harvesting celery blanched by boards in Michigan's famous celery fields, Kalamazoo, Mich.
150 (22141) Assembling Room — chassis ready for engines — Cadillac Automobile Plant, Detroit, Mich.
151 (22142) Experts testing engines in the Cadillac Automobile Plant, Detroit, Mich.
152 (22143) Employees leaving the Ford Motor Company Factory, Detroit, Mich.
153 (22014) Packing salt into barrels for shipment, St. Clair, Mich.
154 (16731) Greatest canal traffic in the world — Busy scene in the ship canal, Sault Ste. Marie, Mich.
155 (22037) A mile underground — loading and handling cars with copper ore, Calumet-Hecla Mines, Calumet, Mich.
156 (22044) Pouring molten copper into ingot molds, Calumet-Hecla Mills, Lake Linden, Mich.
157 (22049) Loading 1400 tons of copper on boat, Houghton, Mich.
158 (11941) "Nursed the little Hiawatha, rocked him in his linden cradle."

WISCONSIN — *3 stereographs or slides*

159 (16709) Group of modern dairy barns and herd of Holstein cattle, Lake Mills, Wis.
160 (16711) Harvesting and loading silage corn in Wisconsin's famous dairy region.
161 (16732) Reclaiming swamp land — digging ditch with tractor and laying drain tile, Wis.

MINNESOTA — *8 stereographs or slides*

162 (20033) A load of logs at the Kettle River Landing, Minnesota Pineries.
163 (6965) Steam shovel at work, showing how track is laid, Burt Mine, Mesabi Range, Minn.
164 (6978) Looking between ore docks No. 2 and No. 3, Two Harbors, Minn.
165 (16708) Holstein cattle and attractive dairy barns and silos, near Moorhead, Minn.
166 (16725) Potato digging machines at work in the famous potato region of the Red River Valley, Moorhead, Minn.
167 (16703) Scene in the busy northern metropolis, Nicollet Ave., Minneapolis, Minn.
168 (11942) "Brought forth food and set before them, brought them water from the brooklet."
169 (11943) "From the wigwam he departed, leading with him Laughing Water."

ture at Iowa State College, Ames, Iowa

ISSOURI — *3 stereographs or slides*

(9518) The magnificent Eads Bridge, St. Louis, M
16714) Busy scene in the Ozark apple region o
Picking, sorting and packing in barrels.
16704) Shaft house, smelter and tailing pile, zinc a
Joplin, Mo.

ORTH DAKOTA — *1 stereograph or slide*

16740) Threshing wheat in the Red River Valley, N

OUTH DAKOTA — *2 stereographs or slides*

16733) Plowing rich prairie soil with tractor, South
16734) Making a good seed bed. Tractor drawing
and 3 section tooth harrows, South Dakot

EBRASKA — *3 stereographs or slides*

16735) Manure spreader followed by tractor plowi
Omaha, Neb.
6748) Handling alfalfa hay with hay loader on the
liam Jennings Bryan, near Lincoln, Neb.
6718) Mounted Sioux Indians in "full feather" l
Nebraska.

NSAS — *4 stereographs or slides*

5736) Thrifty and contented hogs (Poland China)
falfa pasture, Effingham, Kansas.
201) Corn field, Kansas.
710) Splendid Hereford cattle in Kansas feeding
ing open air feeding shed, Manhattan, Kan
475) Round-up on the Sherman Ranch, Geneseo, I

189 (12269) Lordly monarch of western wilds — actual snapshot of wild elk, Montana.

IDAHO — *1 stereograph or slide*

190 (6157) Sheep grazing on range, Idaho.

WYOMING — *7 stereographs or slides*

191 (13579) After winter's first visit — gap of the Golden Gate, Yellowstone National Park, Wyoming.
192 (13588) Angel Terrace, Yellowstone National Park, Wyoming.
193 (13589) Commotion in the Devil's Ink Pot. A moment of eruption, Yellowstone National Park, Wyoming.
194 (13584) "Old Faithful," queen of geysers, Yellowstone National Park, Wyoming.
195 (13581) Rocky Mountain Divide, Yellowstone National Park, Wyo.
196 (13594) A beaver dam, Yellowstone National Park, Wyoming.
197 (13577) Grand Canyon of the Yellowstone National Park, Wyoming.

COLORADO — *8 stereographs or slides*

198 (20213) Cultivating a field of beets, near Greeley, Colorado.
199 (20214) Harvesting wheat raised by the "dry farming method," Ft. Collins, Colorado.
200 (2403) Phoebe's Arch, Palmer Lake, Colorado.
201 (2410) Cathedral Spires, Garden of the Gods, Colorado.
202 (8008) In the heart of the Box Canyon, Colorado.
203 (8080) Stamp mill and gold concentrator, Ouray, Colorado.
204 (8082) Ute Indian and family, Colorado.
205 (8014) "Dismantled towers and turrets broken!" — Cliff dwellers' palace in the Mesa Verde, Colorado.

ARIZONA — *5 stereographs or slides*

206 (13516) The famous log bridge spanning a chasm 50 ft. wide, Petrified Forest, Arizona.
207 (13520) "Behold the realm where the Colorado flows!" Grand Canyon, Arizona.
208 (13660) On the Bright Angel Trail, Grand Canyon of the Colorado, Arizona.
209 (13522) Uncouth vegetable growths of the desert, Arizona.
210 (16742) Reclaiming vast areas by irrigation — the Great Roosevelt Dam near Phoenix, Ariz.

NEW MEXICO — *1 stereograph or slide*

211 (16775) Spineless cactus — A valuable product for semi-arid regions, New Mexico.

UTAH — *2 stereographs or slides*

212 (2454) Salt Lake City, Utah.
213 (2459) Ogden and Wasatch Mountains, Utah.

NEVADA — *1 stereograph or slide*

214 (16759) A silver mining camp nestled in the mountains, Nevada.

Pacific States

28 stereographs or slides

WASHINGTON — *6 stereographs or slides*

215 (20031) Great chained log rafts, containing millions of feet of lumber, on the Columbia River, Wash.

216 (13618) Port Blakely Mills — largest in the world, near Seattle, Puget Sound, Wash.

217 (20027) Shipping lumber, Washington.

218 (11623) Harvesting in the Great West — combined reaper and thresher, Washington.

219 (14135) Looking down a deep crevasse of Paradise Glacier, summit of Mt. Rainier in the distance — Rainier National Park, Wash.

220 (13617) Seattle, looking southwest from the Hotel Washington, Wash.

OREGON — *7 stereographs or slides*

221 (13635) A splendid view of Mt. Hood, Ore.

222 (14103) Crater Lake, Oregon. When a volcano has been quiet for centuries the inside slopes become weathered enough to support life and the crater may be filled with water and become a lake.

223 (6228) Line of sand dunes, Columbia River, Oregon.

224 (13567) One of the great trees that grow in the rainy northwest — showing method of felling, Oregon.

225 (13796) Hydraulic mining, Oregon.

226 (13624) First haul of the season — salmon industry, Columbia River, Ore.

227 (13625) Butchering salmon — interior of a canning establishment, Astoria, Oregon.

CALIFORNIA — *15 stereographs or slides*

228 (5022) The Sierras, from Glacier Rock, Yosemite Valley, Cal.

229 (5007) The Fallen Monarch, Mariposa Grove, Yosemite Valley, Cal.

230 (16743) Market St., Twin Peaks in the distance, San Francisco, Cal.

231 (13299) Remarkable earthquake fissure in the Sobrante Hills, near Berkeley, Cal.

232 (16676) The great American bison that once roamed in countless thousands over our vast prairies, Cal.

233 (20215) A combined steam harvester which reaps, threshes and sacks the wheat, Cal.

234 (16744) Harvesting almonds, San Joaquin County, Cal.

235 (16746) Luther Burbank's spineless cactus, Santa Rosa, Cal.

236 (16747) Tokay Grapes — In a California vineyard, Acampo, Cal.
237 (13546) More than 10,000 acres of navel orange groves, San Gabriel Valley, Cal.
238 (4300) Orange blossoms and fruit, Los Angeles, Cal.
239 (13528) Just out — baby ostriches on the Cawston ostrich farm, California.
240 (13532) Los Angeles pigeon farm, Cal.
241 (13555) San Gabriel Mission, Southern California.
242 (16667) Submarines in the foreground and battle-ships and torpedo boats in the background, San Diego Bay, Cal.

Outlying Possessions of the United States

(EXCEPT THE PHILIPPINES AND GUAM)

19 stereographs or slides

ALASKA — *4 stereographs or slides*

243 (9195) Preparing to climb "The Golden Stair" and Peterson's Trail, Chilkoot, Pass, Alaska.
244 (11518) Drying fish on the Yukon River, Alaska.
245 (9374) Placer mining near the Yukon River, Alaska.
246 (11530) Gold miners and dog team north of the arctic circle, Alaska.

PANAMA, C. Z.— *10 stereographs or slides*

247 (20857) Rubber tree, showing scars from cutting — Palm tree with palm nuts. Panama.
248 (20877) Looking down on the City and Bay of Panama, from Ancon Hill, Panama Canal Zone.
249 (13320) Dwellings erected for employees of old French Canal Company, Colon, Isthmus of Panama.
250 (20889) Site of the Gatun Lock, looking south from the lowest lock towards Lake Gatun — Panama Canal Route.
251 (21740) Excavations measuring 500 ft. deep in Gaillard Cut, Panama Canal.
252 (21783) North over Gatun Locks and sea level entrance to Panama Canal, Atlantic Ocean in the distance.
253 (21784) South over Gatun Locks and Gatun Lake, Emergency Dam in position — a busy scene on the Panama Canal.
254 (21781) U. S. S. Missouri — The first battleship to pass from the Atlantic to the Pacific through the Panama Canal.
255 (21786) Hospital grounds and Ancon Hill from Hotel Tivoli, Panama.
256 (21787) At the Pacific entrance of the Panama Canal — Showing fortified islands, wireless tower and breakwater.

PORTO RICO — *2 stereographs or slides*

257 (10252) Overlooking the harbor, San Juan, Porto Rico.
258 (10264) Cutting the sugar cane, Rio Pedro, Porto Rico.

HAWAII — *3 stereographs or slides*

259 (10154) Luxuriant vegetation in the Mauna Loa Valley, Hawaii.
260 (10161) With the flag goes the public school — Royal School, Honolulu, Hawaii.
261 (10156) Pretty hula girls, Honolulu, Hawaii.

PHILIPPINES — *See* Asia.

GUAM — *See* Asia.

NORTHERN COUNTRIES OF NORTH AMERICA

23 stereographs or slides

CANADA — *17 stereographs or slides*

262 (13895) "In the Acadian Land, on the shores of the Basin of Minas." Nova Scotia, Canada.
263 (13882) Indian basket weaving, Prince Edward Island, Canada.
264 (13987) View from Dufferin Terrace, Quebec, Canada.
265 (16061) Iroquois Indians who participated in tercentenary pageant (1908), Quebec, Can.
266 (16037) Fifth Royal Highlanders of Montreal in a military parade at Quebec.
267 (10625) The wharves, Montreal, Canada.
268 (20927) Winding bobbins in linen mill — Linen industry, Canada.
269 (20932) Weaving the linen fabric — Linen industry, Canada.
270 (20941) Beets stored in sheds with V-shaped bins having canals underneath to carry them to washing drum.
271 (20944) Beet pulp and juice flowing into large iron tanks, where it is subjected to diffusion by water.
272 (20916) Scraping the hair from the hides roughly by machinery — Tanning industry, Canada.
273 (16316) In the thriving metropolis of Western Canada — Main St., Winnipeg, Manitoba, Canada.
274 (13830) A treacherous crevasse in Victoria Glacier — Mt. Lefroy and Mt. Victoria in distance, Canadian Rockies, Canada.
275 (13802) Among the wonderful ice peaks of the Illecillewaet Glacier.
276 (13806) Mt. Sir Donald, the Matterhorn of the North American Alps.
277 (13837) Western terminus of Canadian Pacific Transcontinental R. R., and Burrard Inlet, Vancouver, B. C., Can.

NEWFOUNDLAND — *2 stereographs or slides*

278 (16317) The fisherman's quarters in harbor at St. John's, Newfoundland.
279 (16318) Eskimo dog team on trail, Hopedale, Labrador.

SOUTHERN COUNTRIES OF NORTH AMERICA

24 stereographs or slides

MEXICO — *11 stereographs or slides*

280 (10800) Mexico's principal harbor, Vera Cruz.
281 (10809) Home of the peon — the adobe hut, City of Mexico.
282 (10803) City of Mexico, the ancient Tenochtitlan of the Aztecs.
283 (10910) Soldiers' Monument and Castle of Chapultepec, City of Mexico.
284 (10871) Ancient mode of threshing in Mexico, Pyramid of Sun, San Juan Teotihuacan.
285 (10842) Filling pig skins with juice from maguey plant used in making pulque, the native drink, Tacuba, Mexico.
286 (10888) Carding room, cotton mills, Orizaba, Mexico.
287 (16106) Rich Gold and Silver Mining Center, El Oro, State of Mexico, Mexico.
288 (10865) The sacred shrine on Cholula Pyramid, and "Old Popocatapetl," Cholula, Mexico.
289 (16100) Henequen, the wealth of Yucatan, from which sisal hemp fibre is produced, Mexico.
290 (17787) Mexican musicians and dancing girls in national costume.

Central America

5 stereographs or slides

GUATEMALA — *1 stereograph or slide*

291 (12872) Escuintla and the twin volcanoes Fuego and Acatenango, Guatemala, C. A.

SALVADOR — *1 stereograph or slide*

292 (12860) Tortilla making, Salvador, C. A.

NICARAGUA — *1 stereograph or slide*

293 (12835) Golden and luscious mangoes, the favorite fruit of the natives, Nicaragua, C. A.

COSTA RICA — *1 stereograph or slide*

294 (12804) Harvesting bananas, Costa Rica, C. A.

West Indies

10 stereographs or slides

CUBA — *5 stereographs or slides*

295 (20518) Havana Wharf, Cuba — Unloading coffee from Porto Rico.
296 (9078) General view of the wrecked battleship Maine.
297 (10236) Cutting tobacco grown in the shade of banana trees, Province of Havana, Cuba.
298 (9072) Farming scene, Province of Havana, Cuba.

299 (9415) Santiago and the harbor from the Spanish Block House, Cuba.

MARTINIQUE — *1 stereograph or slide*

300 (14355) Natives fascinated by the fierce and magnificent sight of a volcanic eruption, Gros Morne, Martinique, F. W. I.

JAMAICA — *1 stereograph or slide*

301 (9991) A cattle ranch in Jamaica, B. W. I.

GUADELOUPE — *1 stereograph or slide*

302 (14439) Coffee pickers at work, Guadeloupe, F. W. I.

DOMINICA — *1 stereograph or slide*

303 (14455) The eccentric growth of cacao pods, Dominica, B. W. I.

SOUTH AMERICA

38 stereographs or slides

BRAZIL — *8 stereographs or slides*

304 (20838) Lower city and harbor, Bahia, Brazil.
305 (21822) Avenida Rio Branco from Hotel Avenida on a holiday, Rio de Janeiro, Brazil.
306 (21821) Children of illustrious Brazilian families in an American private school, Rio de Janeiro, Brazil.
307 (21851) Tropical view down the slope of Santa Theresa toward the harbor, Rio de Janeiro, Brazil.
308 (21847) Scene in Rua 15th of November, the principal street, Sao Paulo, Brazil.
309 (21848) Municipal Theatre, one of the handsomest play houses in the world, Sao Paulo, Brazil.
310 (20817) Method of drying coffee, State of Sao Paulo, Brazil.
311 (20816) Carts loaded with coffee leaving the plantation, State of Sao Paulo, Brazil.

URUGUAY — *2 stereographs or slides*

312 (20829) Plaza Independencia showing "Portales," Montevideo, Uruguay.
313 (20827) Great dredge by which the harbor is made navigable, Montevideo, Uruguay.

ARGENTINA — *8 stereographs or slides*

314 (20824) Entrance to the harbor, Buenos Aires, Argentina.
315 (20840) The Government buildings from the balcony of the Bourse.
316 (21809) Four o'clock parade of society in Palermo, a suburb of Buenos Aires, Argentina.
317 (20844) Argentina's famous cattle on range, La Plata, Argentina, So. Am.
318 (21875) Majestic Iguazu Falls, Argentina.

319 (21818) Italian settler and family, vineyards in background, Mendoza, Argentina.
320 (20850) Two typical means of transportation — the high cart and the gig — Alta Gracia, Argentina.
321 (21817) Along the Mendoza River in the Andean Foothills, Argentina.

CHILE — *7 stereographs or slides*

322 (21861) Charming Inca Lake (Laguna del Inca) nestling in the Chilean Andes.
323 (21860) Station from which the train climbs 5000 feet in a few miles to the summit, Juncal, Chile.
324 (21843) Cathedral and Plaza, Chilean woman in native dress, Santiago, Chile.
325 (22369) Nitrate for agriculture and for war being sacked by natives for shipment, Chile.
326 (21865) The harbor and city, Valparaiso, Chile.
327 (21836) Goods arriving at docks for shipment, Valparaiso, Chile.
328 (21874) Indians on the Strait of Magellan near Punta Arenas, Chile.

PERU — *6 stereographs or slides*

329 (21867) Across the Plaza in Arequipa to the famous volcano, Monte Misti, Peru.
330 (21811) In the heart of the rugged Cordilleras Mountains, the Cofa Bridge on the Oroya Railway, Peru.
331 (21871) Natives near wall of Incan Palace — most remarkable monument of ancient Peru, Cuzco.
332 (21869) Tractor with cable drawing harrow and pulverizer to prepare soil for planting sugar cane, Lima, Peru.
333 (21868) Replanting the sugar cane in a large hacienda near Lima, Peru.
334 (21870) Refining silver in smelter at the famous mining center of Cerro de Pasco, Peru.

BOLIVIA — *1 stereograph or slide*

335 (21866) Famous Copacabana Church near Lake Titicaca in Bolivia, llama in foreground.

ECUADOR — *1 stereograph or slide*

336 (21872) Charming Spanish maiden on balcony, Guayaquil, Ecuador.

COLOMBIA — *1 stereograph or slide*

337 (21873) Quaint scene in streets of Barranquilla, Colombia.

VENEZUELA — *4 stereographs or slides*

338 (13314) La Guaira, Venezuela, showing fort bombarded by the British in 1902.

339 (13315) In the narrow streets of La Guaira, Venezuela — native method of distributing milk unadulterated.
340 (13307) National University and Halls of Congress, Caracas, Venezuela.
341 (13309) The city baker making his daily rounds, Caracas, Venezuela.

POLAR REGIONS

(EXCEPT ALASKA AND NORWAY)

5 stereographs or slides

ARCTIC — *2 stereographs or slides*

342 (13325) The twin ships, *Windward* and *Eric* — Peary expedition in 1901 — at Nuerke, 800 miles from North Pole, Greenland.
343 (13329) Eskimo girls and part of Crew *S. S. Eric* — at Upernavik, northernmost Danish trading post, Greenland.

(See also 246 Alaska and 413, 414 and 415 Norway)

ANTARCTIC — *3 stereographs or slides*

344 (13326) Hauling snow for water supply. Belgica Antartic expedition. (1897–99.)
345 (13328) Commander Adrien de Gerlache, leader of the Belgica expedition. (1897–99) on skis hunting seals on South Polar Pack.
346 (13327) Roald Amundsen, discoverer of the South Pole, inspecting ice field near glacier, Antarctic Ocean.

EUROPE

142 stereographs or slides

Great Britain

36 stereographs or slides

ENGLAND — *16 stereographs or slides*

347 (3028) Landing Stage, Liverpool, England.
348 (2101) London Bridge over the Thames River, England.
349 (2111) Tower of London, London, England.
350 (3002) Westminster Abbey, London, England.
351 (3004) The Bank of England, London, England.
352 (11301) The House of Lords, London, England.
353 (6146) The regulator of the world's clocks, Greenwich, England.
354 (3009) Birthplace of William Shakespeare, Stratford-on-Avon, England.
355 (3012) Anne Hathaway's Cottage, Shottery, England.
356 (3010) Shakespeare's Memorial Theater, Stratford-on-Avon, England.
357 (13149) Harvesting wheat in Old England.

358 (21561) Whitefaced Herefords — an English breed of beef cattle of worldwide fame.
359 (21200) A nightingale on its sheltered nest.
360 (3015) York and its Cathedral, England.
361 (13120) Lake Grasmere and Village from Red Bank, Lake District, England.
362 (13123) Rydal Mount, home of Poet Wordsworth, Lake District, England.

WALES — *1 stereograph or slide*

363 (2702) Fairy Glen, Bettws-y-Coed, Wales.

CHANNEL ISLANDS — *1 stereograph or slide*

364 (21522) Jersey cattle, the most famous product of the Island of Jersey, Channel Islands.

SCOTLAND — *9 stereographs or slides*

365 (2610) Princess Street and Waverly Gardens, Edinburgh, Scotland.
366 (12711) Highlanders in native costume at the great Forth Bridge, one and one-half miles long, spanning the Firth of Forth, Queensferry, Scotland.
367 (12703) Historic Stirling Castle, Scotland.
368 (12704) Wallace Monument, the national memorial to Scotland's daring chieftain, Stirling, Scotland.
369 (2607) Ellen's Isle, Loch Katrine, Scotland.
370 (21501) Aberdeen Angus, a noted breed of beef cattle developed in Scotland.
371 (21502) A beautiful and productive type of dairy cattle (Ayrshire) originating in County Ayr, Scotland.
372 (12700) Burns' cottage, room where the poet was born, Ayr, Scotland.
373 (12702) A highland home, Scotland.

IRELAND — *9 stereographs or slides*

374 (2517) Queenstown Harbor, Ireland.
375 (12605) Patrick's Bridge, Cork, Ireland.
376 (2503) Blarney Castle, Ireland.
377 (2500) Lakes of Killarney, Ireland.
378 (6110) Peat from Irish bogs, High Street, Killarney, Ireland.
379 (12600) Suspension bridge, Kenmare, Ireland.
380 (2504) Sackville Street, Dublin, Ireland.
381 (2508) Royal Avenue, Belfast, Ireland.
382 (6854) Giant's Causeway, side view of basaltic columns, Ireland.

GERMAN EMPIRE — *12 stereographs or slides*

383 (6131) The Reichstags-Gebaude, Berlin, Germany.
384 (10303) Royal Palace, Berlin, Germany.

385 (10331) Band of Cuirassier Guards marching to the Parade Grounds, Berlin, Germany.
386 (2011) Hamburg from across the Elbe, Germany.
387 (10336) Market place and cathedral, Nuremburg, Germany.
388 (10376) Making hay in the highlands of Bavaria, Germany.
389 (10371) Kleber Place, in the heart of Strassburg, Germany.
390 (10352) Toiling in the vineyards — picking the luscious grapes, Rudesheim, Germany.
391 (10335) Moonlight on the Rhine, Bingen, Germany.
392 (10339) The great bridge over the Rhine at Bonn, Germany.
393 (2002) Market, Cologne, Germany.
394 (18000) Zeppelin flying over a German town — Lower valley of the Rhine.

BELGIUM — *4 stereographs or slides*

395 (6121) In the vegetable market, Brussels, Belgium.
396 (2084) Milk cart, Antwerp, Belgium.
397 (10115) River Meuse and Parc de la Citadel, Namur, Belgium.
398 (21577) Belgian draft horses — A world champion in foreground.

HOLLAND — *5 stereographs or slides*

399 (2056) Water Street, Zaandam, Holland.
400 (2050) Steamer docks, Rotterdam, Holland.
401 (6436) A Dutch fishing village, Island of Marken, Zuider Zee, Holland.
402 (6435) Quaint street in a Dutch village, Holland.
403 (12201) Dutch farm hands milking Holstein-Friesian cattle near Rotterdam, Holland.

DENMARK — *3 stereographs or slides*

404 (13080) Queen Louise Bridge, Copenhagen, Denmark.
405 (13076) Frederiksholms Canal and Thorwaldsen Museum, Copenhagen, Denmark.
406 (13077) The Krystal-Gade and the Round Tower, Copenhagen, Denmark.

NORWAY — *9 stereographs or slides*

407 (13414) The Lotefos, Norway's most famous waterfall.
408 (13408) In the fair and fertile Jordal Valley — Buerbrae Glacier in distance, Norway.
409 (13496) Carding and spinning wool — Snow capped Mt. Boertenose in the background, Telemarken, Norway.
410 (13420) Making the "flat bread" of the Norwegian peasant, Norway.
411 (13422) Milking the goats, Hardanger Fjord, Norway.
412 (13467) Grindstones which convert the blocks into wood pulp, Paper Mills, Skotifos, Norway.
413 (15770) Laplanders milking the reindeer, Norway.
414 (15774) Midnight sun, North Cape, Lapland.
415 (15768) Floating whale station, Spitzenbergen, Lapland.

SWEDEN — *5 stereographs or slides*

416 (13009) The Vassa Bridge, Stockholm, Sweden.
417 (13003) The Council Room, Royal Palace, Stockholm, Sweden.
418 (13015) Dalecarlian girls at home, Skansen, Stockholm, Sweden.
419 (13017) Women weeding a field of sugar beets, Sweden.
420 (13029) Custom-house scene and harbor of the enterprising city of Goteborg, Sweden.

FRANCE — *11 stereographs or slides*

421 (11741) Bird's-eye view of Paris from the Arch of Triumph, France.
422 (1641) Avenue des Champs Elysees, Paris, France.
423 (11787) Flower market on St. Michael's Bridge at 6 o'clock A. M., Paris, France.
424 (1603) The Grand Opera, Paris, France.
425 (3104) Notre Dame, Paris, France.
426 (18080) Aeroplane on scout duty with French troops.
427 (10732) Glacier des Bossons, Chamonix, France.
428 (10734) Mer de Glace (sea of ice), from the Montanvert, Chamonix, France.
429 (6102) The Cathedral, near busy docks, Marseilles, France.
430 (11760) A seaside paradise — Cannes, France.
431 (11766) Women washing clothes, Nice, France.

MONACO — *1 stereograph or slide*

432 (11754) Monaco — The Prince's Castle in view.

SPAIN — *7 stereographs or slides*

433 (15808) Commodious harbor of Barcelona, looking towards the Columbus Monument and custom-house, Spain.
434 (15814) General view of Burgos, Spain.
435 (15800) Panorama of Madrid, showing fete celebration in the foreground, Spain.
436 (967) Alhambra Palace, Granada, Spain.
437 (15834) Picking Valencia oranges, near Valencia, Spain.
438 (15828) Andalusian carts coming into town, Almeria, Spain.
439 (966) Rock of Gibraltar, England's only possession on mainland of Europe.

SWITZERLAND — *10 stereographs or slides*

440 (10770) To the clouds by rail — Mt. Pilatus, Switzerland.
441 (10798) Braving Alpine perils — on the top of Mt. Pilatus overlooking a sea of clouds, Switzerland.
442 (10781) The Kapellbrucke crossing the River Reuss, Lucerne, Switzerland.
443 (6130) The Wood Carver, Meiringen, Switzerland.
444 (10750) Lauterbrunnen Valley and the lovely fall of the Staubbach, Switzerland.

445 (10702) A mountain chalet, Grindelwald, Switzerland.
446 (10703) Blowing the alpine horn, Grindelwald, Switzerland.
447 (10705) Grindelwald on market day, Switzerland.
448 (10765) Looking at the Matterhorn from Riffelburg Hotel, Switzerland.
449 (10793) Goods for the High Alps, near Zermatt, Switzerland.

ITALY — *10 stereographs or slides*

450 (1901) Rome, the Eternal City, from the balcony of St. Peter's, Italy.
451 (11200) The Tiber, Castle of San Angelo, and St. Peter's Cathedral, Rome, Italy.
452 (11234) Colosseum, the "King of Ruins," Rome, Italy.
453 (1970) Mount Vesuvius in eruption, Naples, Italy.
454 (1972) A Neapolitan team, Naples, Italy.
455 (16830) Street scene in tenement district, Palermo, Sicily.
456 (1952) Florence and River Arno, Italy.
457 (6482) Grand Canal, Venice, Italy.
458 (1941) The Cathedral, Milan, Italy.
459 (6459) Beautiful Lake Como, one of the loveliest spots in the world, Italy.

AUSTRIA-HUNGARY — *7 stereographs or slides*

460 (15614) Marie Theresa Platz, Innsbruck, Austria-Hungary.
461 (15610) Public Square, looking toward Schlossberg, Gratz, Austria.
462 (15607) Along the Danube Canal in the very heart of Vienna, Austria-Hungary.
463 (15655) Traffic in the busy Graben, Vienna, Austria-Hungary.
464 (15656) One of Europe's famous avenues, Andrassy Strasse, Budapest, Hungary.
465 (15609) Polish school children, Zakopane, Galicia, Austria-Hungary.
466 (15611) Natives in market place, Serajevo, Bosnia, Austria-Hungary.

SERBIA — *1 stereograph or slide*

467 (17300) View of junction of Save River with the Danube-Hungarian city of Semlin in distance at the right — from heights of Belgrade, Serbia.

BULGARIA — *2 stereographs or slides*

468 (17207) Street scene showing peasant woman and sidewalk coffee house, Sofia, Bulgaria.
469 (17218) Native market scene, Ruschuk, Bulgaria.

ROUMANIA — *2 stereographs or slides*

470 (17200) The great railway bridge over the Danube River at Cerna-Voda, Roumania.

471 (15658) Roumanian mother and children, on the bank of the Danube, Roumania.

TURKEY — *3 stereographs or slides*

472 (10953) The famous Galata Bridge and the Golden Horn, Constantinople, Turkey.
473 (10963) Market at Stamboul end of Galata Bridge, Constantinople, Turkey.
474 (7178) Street scene in Constantinople, Turkey.

GREECE — *6 stereographs or slides*

475 (964) Athens and Acropolis, Greece.
476 (7127) The Royal Palace, soldiers in national dress, Athens, Greece.
477 (7134) Excavators at work, Old Corinth, Greece.
478 (7155) Ruins of Temple of Zeus, Olympia, Greece.
479 (7170) Treading out the grain, threshing as in olden days, Greece.
480 (7171) Shepherds and their flocks on the Argive Plain, Greece.

RUSSIA IN EUROPE — *8 stereographs or slides*

481 (6652) Fish wives of Finland — a busy scene on the quay.
482 (6656) Senate and the Academy on the Vasili Island, Petrograd, Russia.
483 (6549) The Kremlin, Moscow, Russia.
484 (6644) The great bell market at the Fair, Nizhni Novgorod, Russia.
485 (18105) Market day in the crowded Jewish quarter of Warsaw, Poland.
486 (18104) The Krestchatik, the principal street of Kief, one of the famous old cities of Russia.
487 (18103) Quaint dairy maids delivering milk in earthenware jars suspended on poles, Kief, Russia.
488 (18101) Plowing with a primitive native plow — How the Russian peasant tills his leased fields.

ASIA

67 stereographs or slides

Turkey in Asia

10 stereographs or slides

ASIA MINOR — *3 stereographs or slides*

489 (10969) Looking up the Bosporus toward the Black Sea from the heights above Scutari, Turkey in Asia.
490 (10975) Circassian native types of Asia Minor.
491 (11156) City blacksmith shoeing buffalo on streets of Tarsus, Asia Minor.

SYRIA — *3 stereographs or slides*

492 (11151) Bird's-eye view of Beirut, Syria.
493 (7323) Over the roofs, "the street called Straight," Damascus, Syria.
494 (20703) A Sheik and his bodyguard, Syria.

PALESTINE — *4 stereographs or slides*

495 (7304) View of Jerusalem, from Mount of Olives, Palestine.
496 (7306) Russian pilgrims returning from the Jordan, on the Jericho road, Palestine.
497 (11071) The threshing floor of Nazareth, Palestine.
498 (11058) Native women grinding wheat, Palestine.

Indian Empire

12 stereographs or slides

INDIA PROPER — *10 stereographs or slides*

499 (12501) Madras and harbor, India.
500 (12564) The Howrah Bridge over the Hooghly River in Delta of the Ganges, Calcutta, India.
501 (12556) Pilgrims bathing in the Sacred Ganges before the temple in Benares, the religious center of India.
502 (12531) The Taj Mahal, Agra, India.
503 (12558) Moslem multitudes leaving the Jumma Mosque, Delhi, India.
504 (12560) Abundant and marvelous life of India thronging the spacious thoroughfare, Jaipur, India.
505 (12554) Stately elephants on parade, Jaipur, India.
506 (12565) Spinning and weaving woolen shawls, Srinagar, Kashmir.
507 (1263) Inflated bullock skins for ferry boats on Sutlej River in the Punjab, India.
508 (12561) "The Roof of the World"—The majestic Himalayas rising in matchless splendor above the sea of clouds, Darjeeling, Northern India.

BURMA — *2 stereographs or slides*

509 (12553) Giant beasts of burden, patient elephants hauling logs from the Salwin River, Maulmain, Burma.
510 (12555) Picnic party of Burmese girls in cart drawn by native humped cattle, Mopoon, Burma.

CEYLON — *2 stereographs or slides*

511 (12101) Colombo Harbor from the landing jetty, Ceylon.
512 (12566) Grinding gems, garnets, rubies, sapphires and moonstones, Ratnapora, Ceylon.

CHINA AND MANCHURIA — *12 stereographs or slides*

513 (12052) "Queen's Road," the business thoroughfare in Hongkong, China.

514 (12054) A block of tenements in which some of China's floating population dwell, Hongkong, China.
515 (12079) The Yangtze River Valley at Chinkiang, China.
516 (12076) The Chinese substitute for horse power — manipulating a huge stone roller on the streets of Nanking, China.
517 (14554) China's great river Yangtze, showing Hankow from Wuchang, China.
518 (12093) Conveying salt to the interior by wheelbarrow train, China.
519 (12088) A study of Chinese faces.
520 (12007) Chinese school children and teacher at the American Board of Missions, Peking, China.
521 (14517) Store of rich Chinese tea merchant, Chifu, North China.
522 (6631) Chinese farmer boys tilling the soil, near Port Arthur.
523 (6571) Chinamen sawing timbers for the Japanese Army, Manchuria.
524 (14555) Caravan passing through an ancient gateway in the Great Wall at the head of the Nankow Pass, North China.

Japanese Empire

19 stereographs or slides

JAPAN PROPER — *17 stereographs or slides*

525 (14812) The Sacred Mountain of Fuji-Yama, Japan.
526 (14032) Tokyo, the Japanese Capital.
527 (14063) Overlooking the rice fields — Mississippi Bay in distance, Japan.
528 (14730) Rice planters at work, Japan.
529 (14789) Rice harvest — Cutting the straw close to the ground with a sickle, Japan.
530 (14739) A country girl of Old Japan — Among the famous tea fields of Shizuoka, Japan.
531 (14845) Drying sardines on the beach, Beppu, Japan.
532 (14058) All sorts and sizes — A Japanese shoe shop.
533 (14727) Interior of a Japanese home — showing method of sleeping.
534 (14045) In the "Land of Flowers," a tea house in Japan.
535 (14047) An idyllic spot where little Japanese maids delight to stroll.
536 (14746) Silk worm incubator, Japan.
537 (14744) Gathering mulberry leaves for the silk worms, Japan.
538 (14748) Feeding mulberry leaves to the voracious young silk worms, Japan.
539 (14750) Silkworm cocoons in their nests, Kiryu, Japan.
540 (14753) Reeling silk from cocoons, Kiryu, Japan.
541 (14757) One of Japan's largest modern silk weaving plants — American machinery and American methods, Kiryu, Japan.

East Indies

10 stereographs or slides

AVA — *1 stereograph or slide*

15983) Fancy Javanese cattle at the Bull Races, Mi

'HILIPPINES — *8 stereographs or slides*

10085) "Cascos," the floating homes of many thous boats on the Pasig River, Manila, Island of

10058) Calle Real, principal street of Walled City, top of Parian Gate, Island of Luzon, P. I.

10056) Cattle used as pack animals and for riding the background, Island of Luzon, P. I.

10064) Filipino farmers harrowing rice fields near M

10070) Hulling rice for breakfast — Island of Luzon

10074) Husking coconuts — a familiar scene in the g country near Pagsanjan, Island of Luzon, I

0035) Manila hemp industry — stripping the tree, Ph

0047) Manila hemp industry — interior of a native r Philippines.

JAM — *1 stereograph or slide*

)092) A tropical scene, Island of Guam.

AFRICA

30 stereographs or slides

ROCCO — *1 stereograph or slide*

559 (17020) The Suez Canal from a German liner, looking north, Africa.
560 (9749) The great Nile Bridge, Cairo, Egypt.
561 (9774) Tilling the soil as in ancient days, Egypt.
562 (9759) Threshing beans in the field, Egypt.
563 (6233) Native boys spinning cotton, Egypt.
564 (9812) Inundation of the Nile, Egypt.
565 (9781) The Sphinx and Second Pyramid, Egypt.
566 (9771) Ancient and modern Egypt, Sakkara.
567 (9718) Colossi of Memnon, Thebes, Egypt.
568 (9737) Ruins of Karnak, Egypt.
569 (6242) The great dam; Assuan, Egypt.

BRITISH EAST AFRICA — *4 stereographs or slides*

570 (17033) Peeling bark for making bark cloth, Uganda, Africa.
571 (17034) Sisal hemp plantation in blossom, Uganda, Africa.
572 (17011) The native market at Port Florence, Lake Victoria Nyanza, Africa.
573 (17005) Shipping ivory at Mombasa, Africa.

GERMAN EAST AFRICA — *1 stereograph or slide*

574 (17018) Dar-es-Salaam, the chief city and port of German East Africa.

RHODESIA — *4 stereographs or slides*

575 (17023) Scene above bridge on the Cape to Cairo Railway, over Zambezi River, near Victoria Falls, Africa.
576 (17004) Victoria Falls on the Zambezi River, Rhodesia, Africa.
577 (17012) Result of a morning's hippopotamus hunt on Mlembo River, Rhodesia, Africa.
578 (17015) Returning with trophies from a big game hunt, Rhodesia, Africa.

UNION OF SOUTH AFRICA — *6 stereographs or slides*

579 (11979) Gold quartz mining, 10th level, 1,200 feet underground, Robinson Mine, Johannesburg, South Africa.
580 (11881) Imperial Army transports crossing the Vaal River at Viljoen's Drift, South Africa.
581 (17026) Taking out the "diamantiferous blue earth" at Wesselton Diamond Mines, Kimberley, South Africa.
582 (17008) City Hall from parade ground, showing Table Mountain, Cape Town, South Africa.
583 (11994) Millions of South African gannets, near Capetown, South Africa.
584 (10714) Penguins on Dassen Island Near Capetown, South Africa.

east from the Exhibition Dome.

15908) Federal Parliament Building, Melbourne, Vict

SOUTH AUSTRALIA — *1 stereograph or slide*

15902) Kangaroo in the zoological garden, Adela Australia.

QUEENSLAND — *1 stereograph or slide*

15984) Range cattle, an important source of Australi

TASMANIA — *1 stereograph or slide*

15903) Elizabeth Street and the Union Bank of Aust bart, Tasmania.

NEW ZEALAND — *1 stereograph or slide*

15978) Looking across Auckland Harbor towards Auck Northcote, New Zealand.

FIJI ISLANDS — *1 stereograph or slide*

15913) Typical natives of the Fiji Islands, Suva.

EARTH NEIGHBORS

8 stereographs or slides

6764) The Sun photographed through forty-inch Yerkes Observatory.

6648) The full Moon. Yerkes Observatory.

6646) Moon at age of seventeen days. Yerkes Obse

6766) The planet Mars. Yerkes Observatory.

5767) The planet Saturn. Solar Observatory, at M

2. PEOPLE OF ALL LANDS

RACIAL GEOGRAPHY

By MARK JEFFERSON, A.M.

PROFESSOR OF GEOGRAPHY, MICHIGAN STATE NORMAL COLLEGE, YPSILANTI, MICH.

The most common way to distinguish the races of men is by the color of their skins. For us the great race must always be the white one. The others are the yellow (red) and the black. These names are not accurately applied. Black is the best, yet black people never are really black. There is greater difference of color between a fair Norwegian and a swarthy Italian than between the Italian and a black, but the names white, yellow, black stand because of long usage. Races are more accurately distinguished by the shape of the skull, by the features, and still better by the form of the hair. The Caucasian people are marked by the slender prominent nose and by soft, wavy hair. Each hair has an oval cross section, and the oval form enables it to bend easily. Compare this with the kinky hair which, with the broad flat nose and thick lips, is characteristic of the negro. The hair is kinky because each hair is flat like a ribbon. The yellow and red men have round, rod-like hair which is always straight, and high cheek bones. The yellow men also are marked by slanting eyes. Each race is divided into great families of related people having similarities of color, size, shape and disposition. Such are the Teutonic, the Celtic, the Slavonic families of the Caucasian race.

Of the 1700 millions of men today (1917), more than half — 900 million — are white. They live in Europe or colonies from Europe, and parts of India and Malaysia. They are the dominant race in every continent, the only race of men that have learned to use the forces of nature widely. The only race to increase their powers greatly by the use of machinery and scientific knowledge.

The 600 millions of the yellow race are next in importance. They live mostly in Asia and have attained in China and Japan a degree of culture only second to that of the whites. Indeed, now that they have begun to study western science, it is not certain that they are still behind. Japan is today one of the six Great Powers of the World. Twenty-five million red men in America are closely like the yellow men in physical characters, the hair rod-like and high cheek bones as in Asia. There is no historic knowledge of their coming to America, but they are of the yellow race and doubtless came to the New World by Bering Sea. In Mexico and Peru a few of them attained a moderate amount of civilization, but doubtless the farming Indians of Oklahoma are today the most cultivated individuals this race has ever known.

Two hundred million blacks, in Africa and Australasia, are the least progressive race of men. Only in America the descendants of African slaves have had some aspect of civilization thrust upon them. These brief notes on the cultures of the different races find considerable illustration in the stereographs.

1. WHITE (CAUCASIAN) RACE

The white or Caucasian race includes a large number of related peoples with many characteristics in common but differing in many ways. The skins of the people of the white race are really of a great variety of colors — very light in Norway and almost black in India or Arabia. A strong racial characteristic is the wavy or curly hair — the individual hairs being slightly flattened threads.

The white race is the dominant race. It has attained a high degree of civilization through its ability to meet successfully its environment and to utilize the forces and resources of nature to carry on its work. Our material civilization is founded on labor — the labor of the individual or its man-power equivalent in mechanical energy. "The power of Greece, whereby she achieved such great things in all directions of human progress, was largely based in the first instance on the work done by the slaves. On the average, each Greek freeman, each Greek family, had five slaves, whom we think of

not at all when we speak of the Greeks, and yet these were the men who supplied a great part of the Greek energy." These slaves not only did the work of the nation, but they made it possible for the free Greek people to devote their time to the cultivation of their minds, thus making further progress possible. Through present day control of water, steam, gas and electric energy and the invention and construction of many mechanical appliances in a modern civilized nation such as the United States, England or Germany, each family has working for it the man-power equivalent of more than twenty slaves. "We have become a nation of engineers pressing buttons and pulling levers, oiling and packing, so that the great social machine will work smoothly and as easily as possible."

VARIOUS TYPES IN AMERICA

In America, "the melting pot of the nations," there have been brought together large groups of the more advanced peoples of the Caucasian race, who are building a high type of civilization.

What peoples colonized America? What other peoples arrived later? What nations furnish most of our immigrants today? Give racial characteristics of each large group that has contributed to our population. In what section is the influence of each group best shown? What is each contributing toward our greater America?

94 Making paper money, Bureau of Engraving, Washington, D. C. Advanced peoples characteristically occupied in skilled labor.

69 Filling shell with nitro-glycerine. Occupation calling for knowledge and coolness.

148 Building dikes, St. Louis, Mo. White laborers resourceful in emergencies.

166 Potato digging machines, Moorhead, Minn. High priced white labor in America made effectively cheap by multiplying its power with the use of machines.

27 Shows engineering skill of the white race.

170 How the American has harnessed the power of a great river.

30, 139 Trade centers of a complex civilization.

31, 43 Handling transportation problems.

161, 180, 178, 179, 181, 233, 177 Show the white man's application of mechanical power and skill to agricultural problems.

152, 144, 14, 16, 40, 41, 54 Show something of our great factory systems made possible by the mechanical skill and organizing genius of the white race.

128 How the inventive genius of the white race multiplies man-power a hundred fold.

250 to 256 Building the Panama Canal. One of the greatest achievements of the race.

60 In the surf, Atlantic City. The pastimes of the Caucasians are highly developed.
226 First haul of the season, Columbia River Salmon Fisheries, Oregon. Unskilled labor on the frontiers.
243, 246 Men enduring hardships in search of gold.
5 Skilled Italian workmen with a heritage of artistic talent.
266 Fifth Royal Highlanders at Quebec with traditional costume of the Scotch Highlands.

LATIN PEOPLES IN AMERICA

By far the greater part of the western continent is occupied by Latin peoples, that is by peoples whose language and customs are derived from those of ancient Rome. Latin America includes Mexico, Central America, the West Indies and all of South America.

Portuguese

306 Well-to-do Brazilian children, Rio de Janeiro, Brazil. Properly Creoles, European by blood, American by birth. Brazil was colonized by the Portuguese who are considered typical representatives of the Mediterranean branch of the Caucasian race. They are usually short and very dark.

Spanish

336 Charming Spanish girl on balcony, Guayaquil, Ecuador. The ruling minority in Ecuador is of fairly pure Spanish blood.
337 Streets of Barranquilla, Colombia. Good street scene.
339 In LaGuaira Streets, Venezuela. A typical Spanish-American street scene.

Italian

319 Italian settlers, Mendoza, Argentina Republic. These Italians are becoming enormously numerous in the Argentina Republic. They alone cultivate the wheat for which that country is best known and most of the grapes.

TEUTONIC PEOPLES

The Teutons are tall, with very fair skins, light hair, blue eyes, red cheeks and slender, prominent noses. Most of the people of northern and western Europe are of Teutonic blood. The Scandinavians, inhabitants of Norway and Sweden, are considered the purest types of Teutonic people. Teutons are very progressive in scientific practical ways.

Germany

The Germans are a mixed people. In the North and West, they are of the Teutonic type. In the South they are partly Celtic, while east Germany is partly Slav. They are scientific, practical, well organized people.

385 Cuirassier Guards in Berlin. The Army on which Modern Germany has based its hopes — The crowd is kept well back, not smothering the troops as they would with us.

388 Making hay in the highlands of Bavaria. Shows hand labor, typical costume, and probably people of the short broad-headed Alpine race.

390 Picking grapes in the vineyards of Rudesheim, Germany. Women at work in the fields characteristic of all Europe.

393 Market at Cologne. Very characteristic. Note the number of women.

England

The English are a mixture of Anglo-Saxon, Celtic and Mediterranean people, in which the Anglo-Saxon element predominates. The name Anglo-Saxon comes from Angles and Saxons, two Teutonic tribes which conquered England before the seventh century. As a rule, the English are tall and are about half blond and half brunet. They are among the most advanced people in the world in government, literature and industrial arts.

347 Landing Stage, Liverpool, England. The grouping of the people and their very carriage are characteristic of the English.

351 Bank of England, London, street life.

355 Anne Hathaway's Cottage, Shottery, England. The faces are small but English, and attitudes and costume are typical.

357 Harvesting wheat in Old England.

Belgium.

Only the northern Belgians are Teutonic; those in the south are Celtic.

395 In the vegetable market, Brussels, Belgium. Street scenes and life.

396 Milk cart at Antwerp. A most industrious country. Belgium is Dutch in the north and French (Celtic) in the south.

Holland

The people of Holland are characteristically Teutonic.

402 Quaint village street in Holland. Costumes are very striking. These people thrive by much industry and cling to old ways.

403 Dutch farm hands milking Holstein Friesian cattle near Rotterdam, Holland.

Norway

Almost all Norwegians are very light skinned, with yellow hair, blue eyes, pink cheeks. There are fewer dark ones. Norwegians are almost purely Teutonic.

409 Carding and spinning wool, Telemarken, Norway. This is the home of the fair and tall northern long-headed race.

410 Making the "flat bread" of the Norwegian peasant.
411 Milking the goats, Hardanger Fjord.

Sweden

The Swedes are very blond, pure types of Teutonic people.

418 Dalecarlian girls at home "Scansen," Stockholm. These Swedes are examples of the fair, tall, northern long-headed race. The costumes are characteristic of a somewhat isolated people, very slow to change.
419 Women weeding a field of sugar beets. Much heavy manual work and especially for women.

CELTIC PEOPLES

The Celts were a short round-headed people with brown or black hair and gray or brown eyes. They are very progressive.

Scotland

Only the highland Scotch are Celtic. The lowlanders are Teutonic.

366 Highlanders in costume, by the Forth Bridge, Queensferry. The highland costume, preserved in the uniform of some famous regiments of the British army, arose in the isolation of the highland glens.
373 Tea table by a highland cottage, Scotland. (See also 266 Scottish peoples in Canada.)

Ireland

378 Irish coal for sale, Killarney, High Street. There are now more Irish in the United States than in Ireland.

Wales

77 Welsh types in American coal mines.

Switzerland

The Swiss belong to the Celtic family almost entirely and remains of their ancient dwellings indicate that this has always been so. The Swiss speak German, French and Italian in the various cantons.

443 Wood carver, Meiringen. Example of the Alpine, broad-headed race.
447 Grindewald on market day. Small, but good Swiss types.
449 Goods for the high Alps near Zermatt. Well illustrates the hard, heavy labor which, when combined with spare diet, stunts the mountain races.

France

A considerable part of the French people and especially the northwestern provinces are of Celtic origin.

LATIN PEOPLES IN EUROPE

(See also Latin Peoples in America)

Latin peoples are those whose languages and customs are derived directly from those of ancient Rome.

France

The French people are a mixture being partly of the Celtic, partly of the Teutonic and partly of the Mediterranean type. They are very progressive, artistic and thrifty.

423 Flower market at Michael's bridge, Paris. The French are wonderfully pleasant and capable at buying and selling. They are largely Celtic.

146 French war commission — Joffre, blue-eyed Celtic or Teutonic type; Fabry, Celtic; Viviani and Chocheprat, Latin.

431 Women washing clothes, Nice. All the Latin peoples do in the open much work that northerners do in houses, which tends to sociability and good manners.

Spain

The Spanish are almost universally dark skinned with black hair and eyes.

435 Panorama of Madrid. The figures in the near foreground are typical. These are of the dark southern long-headed race, of medium stature.

438 Andalusian carts coming into Almeria. Note the bad road and the unprosperous people.

Italian Sicily

455 Tenement district, Palermo. Life is spent as much as possible in the open air, but it is plain that they enjoy life.

Roumanians

The Roumanians claim a direct descent from the old Romans.

471 Roumanian mother and children.

HELLENIC PEOPLES

Modern Hellenes differ from the other Mediterranean people only in their language which is derived from the Ancient Greek.

Greece

The present day Greeks can hardly claim descent from the ancient Greeks for their country has been over run by all sorts of people from Goths to Turks. They resemble the Latin people in appearance.

476 The Royal Palace, Athens. The soldier's costume is perpetuated by use in the army, as in the case of the Scotch Highlanders.

Peculiar dress is apt to arise in communities isolated in mountain valleys.

479 Treading out the grain, threshing as of old. Old ways of dress, old ways of speech and old ways of work are characteristic.

SLAVONIC PEOPLES

The Slavs occupy the eastern part of Europe and on the whole are not so far advanced as the Teutons, Celts or the Latin people. They are commonly of medium height with dark hair and grey or hazel eyes.

Polish Galicia (Austria-Hungary)

465 Polish school children, Zakopane.

Bosnia Austria-Hungary

466 Natives in market place, Serajevo.

Russia

European Russia has a population which is almost entirely Slavonic. They are making rapid advances in late years.

487 Quaint dairy maids, Kiev.
488 Primitive plow. Old costume, old ways, and little progress.
496 Russian Pilgrims return from the Jordan, Palestine. Characteristic of the simple faith of the Russian people is the great importance they attach to a visit to the Holy Land and baptism in Jordan.
544 Boarding train at Kansk, Siberia. Russian emigrants.

PEOPLE OF THE CAUCASUS

People of the Caucasus are mountaineers, largely isolated from the rest of the world. The most prominent tribe is the Circassian noted for physical beauty.

490 Circassian native types, Asia Minor.

SEMITIC PEOPLES

Jews, Arabs, Syrians, Armenians and north Africans are Semites. They are dark skinned, some of them as black as negroes, but their features and hair show they are members of the Caucasian race.

Syria

Syrians are not a progressive people.

491 City blacksmith shoeing buffalo on streets of Tarsus.
494 A sheik and his bodyguard. A good type of the desert Semites, in clothing, arms and mount.

Palestine

Palestine or the Holy Land is the southern part of Syria.

498 Native women grinding wheat. Such labor as this with the simplest possible mechanical appliances, is not merely curious but characteristic of the Semitic peoples.

Russia

In Russia the Jews are crowded into one quarter and so are not progressive as in the western countries where they are scattered among the rest of the population.

485 Jewish quarters, Warsaw, Poland. Costumes and faces are typically Jewish.

Eygpt

566 Tigran Bey and his servant. Sakkara. Both are very black, yet their features indicate that they belong to the white race.

CAUCASIAN PEOPLES OF INDIA

The Caucasians of India are very dark, with dark eyes and hair. There seems to have been a mixture with yellow or black people.

503 Some interesting types of Caucasian peoples of India.

506 Spinning and weaving woolen shawls, Srinagar, Kashmir. By language many Indian peoples are cousins of the great peoples of Europe, and racially they have much in common. But in habits they have grown far apart. The people of northern India are the lightest in color.

507 Inflated bullock skins for ferry boats, Sutlej River, Punjab. The most curious thing about such a contrivance is that people could be willing to put up with a contrivance which served its purpose so badly.

Ceylon

512 Grinding gems at Ratnapora. The product, we are sure, will be of a high degree of artistic skill and finish, but how profitable to put a little more thought on the machine!

CAUCASIAN PEOPLES OF THE PACIFIC

Some of the inhabitants of the islands of the Pacific are undoubtedly of the Caucasian race as is shown by the head and the hair. There is probably a mixture with either the black or yellow race.

Hawaiian Islands

The features of the native Hawaiians are often very distinctly of the Caucasian type.

261 Hula Girls, Honolulu.

AUSTRALIA

The Australians are really Europeans who have migrated or their descendants. They are very much like the people of the United States.

For the most part they came from the British Isles and are Teutonic or Celtic.

590 Street life similar to ours.

2. YELLOW RACE

The skin tint is really very varied even among the "yellow" Mongolians and the "red" Indians. A very strong characteristic of the whole race is its straight, rather coarse hair. Each individual hair is round and rod-like. That is why it is straight.

A. MONGOLIAN PEOPLES

Norway (Lapland)

413 Laplanders milking reindeer. Practically all the dwellers by the Arctic in Europe as well as Asia and America are Mongols.

North Greenland

343 Eskimo girls at Upernavik. The Mongolian character of the Eskimo and Indian face together with other physical characters and habits make it practically certain that they came from Asia. The Eskimos of Greenland have a considerable percentage of Scandinavian (Danish) blood.

Bulgaria

Bulgarians now are of Mongol stock with a large admixture of Slavonic blood.

469 Market scene in Rustchuk. The Bulgarians are known to be Mongols who came into Europe from Asia and adopted a Slavonic language there, illustrating how poor a guide to race is language.

Burma

510 Picnic party of Burmese girls in buffalo cart, Mopoon, Burma. The facial character is strongly Mongolian.

China

The people of China are typical of the real Mongolians. They have the yellow skin, slanting eyes and straight hair. Many of the Chinese are very tall.

520 Chinese school children and teacher, Peking, China.
522 Chinese farmer boys, near Port Arthur.
519 A study of Chinese faces.
517 Villages on the Yangtse-Kiang.
518 A wheelbarrow train of salt. On a bad road one wheel is better than four.
521 Store of Chinese tea merchant, Chifu, China. Chinese costume and street life.

523 Chinamen sawing timber for Japanese Army, Manchuria. Illustrating methods of work that seem very inferior to ours, but it must be remembered human labor is very cheap in China. A steam engine is not always economical there.

227 Chinamen working in Salmon canning factories, Astoria, Ore. Illustrating the modern migration of cheap unskilled labor from Asia to America. Were it not restricted by law it would take very large proportions.

Japan

The Japanese are the most advanced of all the Mongolian people.

530 Country girl of old Japan in the tea fields, Shizuoka.

531 Drying sardines on the beach, Beppu. In Japan as in Continental Europe women do much field work.

532 A Japanese shoe shop. These people have worked out a life that differs from ours in almost every detail.

533 Japanese bed. The native way.

534 Japanese babies. It is reported that Japanese babies never cry!

535 Japanese maids in a garden.

528 Rice planters at work, Japan. Illustrating the great amount of hand labor done in the east, and properly so because it is so cheap.

529 Rice harvest with sickle.

536 Silk worm incubator.

537 Gathering mulberry leaves for silk worms. The whole silk business depends on cheap labor.

538 Feeding silkworms on mulberry leaves. The partly closed eyes of the girl well show the "slant eyes" of the Mongolian people.

540 Reeling silk from cocoons, Kiryu.

541 Modern silk mill with American machinery. This is the Japan that has put on European clothes and European ways — the new Japan.

Chosen (Korea)

The people of Chosen resemble the Chinese more than the Japanese.

542 White robed pottery peddlers, Seoul, Korea. Native life.

543 Charcoal carriers.

Luzon Philippinos

The Philippinos are brown in color and are probably a variation of the yellow race.

550 Hulling rice for breakfast.

B. AMERICAN INDIANS (RED RACE)

The American Indian is copper colored, he has high cheek bones, black eyes, and straight, rod-like, black hair. The eyes do not slant.

te Indian and family, Colorado. The Indian today i
when he lives apart from the whites.
rying fish on the Yukon River, Alaska.

Canada

idians weaving baskets, Prince Edward Island. The
lives among white men today dresses in discarded
clothes and is degraded at once.
oquois Indians re-enacting their past at Quebec.

Mexico

peoples of Mexico, and they are very numerous dis
the same race as the other American Indians, the Pe
cimos. The old Mexicans and Peruvians were the o
eoples that live in regions where the soil was go
ain fell to support forests. Where there were fore
uld only live as a savage in the natural clearings. V
e he could not clear the forest away. On the treele
ico and Peru he was able to live entirely by agricult
arned to bring water from occasional streams. So i
is he became somewhat civilized.

exico's principal harbor, Vera Cruz. More than half
of Mexico are Indians and a great many of the re
reeds. They preserve their native Indian language
oms in many cases.
obe hut of the peon, City of Mexico. The flat roofs
he climate is dry.
cient mode of threshing. Pyramid of the Sun. Ex
at the Mexican appears to have adopted white man

Peru

331 Natives in Cuzco. These are descendants of the partly civilized ancient Peruvians but they are today very backward people.

Venezuela

340 National University, Caracas. There is a good deal of Spanish blood admixed with the Indian here.

338 LaGuaira. Almost no women accompanied the early Spanish "conquistadores" of America. The descendants of the early Spaniards and native women are now accounted of "pure" Spanish descent.

341 The city baker, Caracas. Woolly hair often indicates admixture of negro blood, for slaves were brought to South America in the old days as well as to the United States, though they were set free long before our Civil War.

3. THE BLACK RACE

There is much more appropriateness in calling this great race black than the Caucasians white yet there are considerable variations in tint here. The blacks in the tropics have an admirable mahogany tint, a warm glow in their skins that is difficult to imagine if you have seen them only in the temperate zone. A strong racial characteristic is their kinky or strongly curly hair, resulting from the fact that each individual hair is flat like a ribbon rather than round like a thread.

Fiji Islands, Pacific Ocean

592 Typical natives. Suva. Note the black, curly hair.

South Africa

581 Kaffirs working in the diamond mines at Kimberley. These blacks are overwhelmingly more numerous than the white people of South Africa and are natives of the country. They are distinctly the working class and have no part in government.

579 Negro laborers mining gold. Johannesburg, So. Africa.

570 Negro in Africa making primitive clothing from bark.

572, 577, 578 Negro life under tropical African conditions.

Africans in America

These are descendants of blacks brought here from Africa as slaves.

105 Hoeing rice, South Carolina. The blacks are the laboring class of the southern states. They receive small pay and give little work for it.

115 Loading phosphate (fertilizer) from the beds, Columbia, Tenn. Blacks as manual laborers.

117 Picking cotton on a Mississippi plantation. When machines are introduced for this, cotton will be much cheaper.

118 Harvesting Peanuts, Marianna, Ark. About a third of the people of the South are blacks but most of the manual labor there is done by this class.

249 Black workers of Old Panama Canal Co., Panama. When the actual Canal was dug by the United States, negroes from Jamaica as well as whites from Spain were employed but the latter were more economical even at higher wages.

258 Cutting sugar cane. In Porto Rico the intermingling of whites and blacks has gone very far and negro blood does not lower a man in the eyes of society.

302 Coffee pickers, Island of Guadeloupe, F. W. Indies. These are probably French mulattoes mostly, the turban is the sign and the French blood gives them a touch of French taste that is at once visible in their dress. The French island blacks are easily recognized.

3. PRODUCTION AND MANUFACTURING

INDUSTRIAL GEOGRAPHY

By CHARLES REDWAY DRYER, M.A., M.D.

GEOGRAPHER, FORT WAYNE, IND.

This is an industrial age. In recent years, there has been a rapid growth in our industrial resources and equipment. There has been a marked movement of our population to the larger centers where manufacturing on a large scale has become the rule. Our inventive skill and our genius for organization have produced great factories equipped with labor saving machinery, handled by skilled workers. Under such conditions, production has gone forward at a rapid rate. The Great World War has put this vast productive system to the strongest test. It also has served to emphasize most clearly agriculture, which is not only our greatest industry, but also supplies the material for many other industries.

This set of stereographs and lantern slides contains a very considerable range of material dealing with industries. In this classification, we are treating Industrial Geography as dealing with *Production* and *Manufacturing,* leaving for the classifications on Commercial Geography to present the *Transportation* and *Marketing* of products.

The instructor may wish to present the question of production and manufacturing by the consideration of a given industry as a whole. This plan is followed in Part I. Again he may wish to deal with industrial material upon the basis of the processes concerned. For such a classification see Part II.

PART I

A. FOOD PRODUCTS

1. VEGETABLE PRODUCTS AND THEIR MANUFACTURE

(a) GRAINS

Corn

180 Fertilizing and plowing corn field.
184 Field of corn, the king of cereals.
136 Modern method corn harvesting.
137 Corn cut by hand.
160 Harvesting and loading silage corn.
165 Silo which enables the dairyman to feed milk-producing green fodder throughout the winter.
292 Primitive way of preparing corn for the table.
341 Primitive way of selling bread, Caracas, Venezuela.

Wheat

Modern Methods

178 Plowing for wheat with tractor.
179 Making a good seed bed for wheat with tractor.
357 Usual way of cutting wheat with binder.
199 Wheat in the shock.
177 Threshing wheat with modern equipment.
233 Steam reaper and thresher.
218 Combined reaper and thresher using horse power.
154 "Soo" Canal, through which millions of bushels of wheat pass in ship loads on way to eastern elevators and shipping points.
48 Grain ships unloading at elevators, Buffalo.

Primitive Methods

488 Russian peasant plowing with primitive plow.
561 Plowing as in ancient days, Egypt.
522 Plowing in China.
284 Ancient mode of threshing in Mexico.
479 Threshing as in olden days, Greece.
497 Threshing floor of Nazareth, Palestine.
498 Native women grinding wheat, Palestine.

Barley

410 Making the barley "flat bread," Norway.
566 Barley field, Egypt.

Oats

147 Loading oats in the field.
408 Small field of oats, Norway.

Rice

105 Hoeing rice, South Carolina.
104 Irrigating rice field, South Carolina.
549 Filipino harrowing rice field.
550 Filipino women hulling rice for breakfast.
528 Rice planters at work, Japan.
527 Rice fields being irrigated, Japan.
530 Rice on the lowlands, tea on the uplands, Japan.
529 Harvesting rice, also showing rice straw hat, Japan.

See Paper in this classification for use of rice straw.

(b) VEGETABLES

Potatoes

47 Potatoes growing on a truck farm.
166 Modern potato digging machines, Minn.

Beans

562 Threshing beans in the field, Egypt.

Onions, Cabbage

469 Onions and cabbage for sale in a Bulgarian market.

Pumpkins

137 Pumpkins on an Indiana farm.

(c) SUGAR

Beet

419 Women weeding field of beets in Sweden.
198 Cultivating a field of sugar beets.
270 Beets stored to make into sugar.
271 Beet pulp and juice in sugar factory.
35 Granulated sugar is made from either beet or cane.

Cane

332 Tractor preparing soil for planting sugar cane, Peru.
333 Replanting sugar cane near Lima, Peru.
258 Cutting the sugar cane, Rio Pedro, Porto Rico.
35 Granulated sugar is made from either beet or cane.
34 Conveyor with trays of loaf sugar received from drying kiln, New York.

Maple

130 Tapping a sugar maple tree; showing gathering tank for the sap and house where sap is evaporated and maple syrup and sugar are made.

(d) FRUITS

Bananas

294 Harvesting bananas, Costa Rica.
259 Banana tree used for ornamentation, Hawaii.
297 The banana planted for shade in a tobacco plantation, Cuba.
302 The banana planted for shade in a coffee plantation, Guadeloupe, F. W. I.
570, 575 The banana in Africa.

Oranges

237 Navel orange groves, San Gabriel Valley, California.
238 Orange blossoms and fruit, California.
437 Picking Valencia oranges near Valencia, Spain.

Pineapples

108 Harvesting pineapples, Fla.

Grapes

236 Tokay grapes in a California vineyard.
319 Grape vineyards in Mendoza, Argentina, S. A.
390 Picking the luscious grapes, Rudesheim, Germany.
438 Hauling barrels of Malaga grapes to Almeria, Spain for shipping abroad.

Mangoes

293 Golden and luscious mangoes, Nicaragua, C. A.

Papaya

259 Fruit of the papaw tree, Hawaii.

Dates

556, 566 Date palm, furnishing fruit and wood in many semi-desert parts of Asia and Africa.

Olive

495 The olive tree, an evergreen tree of the Mediterranean region.
556 Shipping barrels of olive oil from Algiers, North Africa.

Peach

85 Gathering peaches in Delaware.

Apples

44 Summer spraying in apple orchard in New York.
175 Picking, sorting and packing apples in barrels, Missouri.

Figs

489 Three fig trees in foreground, Scutari, Turkey.

(e) NUTS

Almonds

234 Harvesting almonds, San Joaquin County, Calif.

Coconuts

249 The coconut palm in the Panama Canal Zone.
259 The coconut palm in the Hawaiian Island.
551 Husking the coconuts and splitting them to dry in the sun, P. I.

Chestnuts

70 Group of tall chestnut trees growing from an old stump. Pennsylvania has more chestnut timber than has any other state.

Peanuts

118 Harvesting peanuts in Arkansas, commonly classed as a nut but in reality a vegetable.

Pine Nuts

201 Nut pine, a small scrubby tree with nut-like edible fruit growing in semi-arid regions.
211 The nut pine growing on a hill in New Mexico.

(f) BEVERAGES

Cocoa

303 Cacao pods, containing beans from which cocoa and chocolate are made.

Coffee

302 Picking coffee in Guadaloupe, F. W. I.
310 Method of drying coffee, state of Sao Paulo, Brazil, S. A.
311 Carts loaded with coffee leaving plantation, Brazil, S. A.
295 Unloading coffee at Havana wharf, Cuba.
468 Sidewalk coffee house, Sofia, Bulgaria.

Tea

530 Among the famous tea fields of Shizuoka, Japan.
521 Store of Chinese tea merchant, Chifu.
534 Tea house in Japan.
373 Serving tea in Scotland.

Pulque

285 Filling pig skins with juice from maguey plant, Mexico.
287 Single maguey or century plant, with field of them beyond.

2. ANIMAL PRODUCTS AND THEIR MANUFACTURE

(a) Dairying, Milk and Butter

Cows

159 Group of modern dairy barns and herd of Holstein cattle, Wis.
165 Holstein cattle and attractive dairy barns and silo, Minn.
57 Milking scene in modern dairy, N. J.
46 Automatic machine for filling and capping bottles of milk.
45 Washing 1,000 pounds of freshly churned butter.
487 Quaint dairy maids delivering milk, Kiev, Russia.
339 Native method of distributing milk, La Guayra, Venezuela.
403 Milking Holstein-Friesian cattle near Rotterdam, Holland.
364 Jersey cattle, the most famous product of the Island of Jersey.
356 Dairy shorthorn cattle in England.
371 Dairy cattle developed in County Ayrshire, Scotland.
591 Dairy cattle in New Zealand.

Goats

411 Milking goats, Hardanger Fjord, Norway.

Reindeer

413 Laplanders milking reindeer, Norway.

(b) Beef

370 Aberdeen Angus, a noted breed of beef cattle.
317 Shorthorns, Argentine's famous cattle.
358 White faced Herefords — beef cattle of world wide fame.
589 Hereford range cattle, Australia.
127 Making a drive of Hereford cattle in Texas.
185 Hereford cattle, being fattened for market.
140 Cattle at Union Stock Yards, Chicago.
141 The last process in dressing beef — washing with boiling water.
186 Round-up of range cattle on Sherman Ranch, Geneseo, Kans.
301 A cattle ranch in Jamaica.
580 Cattle (Devon in foreground) as draft animals, later as beef.
545 Fancy Japanese cattle, the "hump cattle" of Asia.
549 The water buffalo, an important meat supply.
Other cattle scenes, 284, 298, 337, 548, 510, 497, 491, 561, 562, 454.
For hides and their manufacture see topic of Leather in this classification.

(c) Pork

183 Poland China hogs in alfalfa pasture, Kansas.
172 Hogs in rape pasture, Iowa.
180 Group of colony hog houses in distance, Nebraska.
122 The hog is a good forager, oil district, Texas.
142 Splitting backbones and final inspection of hogs before placing them in refrigerator rooms, Chicago.

143 Trimming and skinning hams before pickling in preparation for the market, Chicago.
144 Making link sausages with the aid of machines which stuff ten feet per second, Chicago.

By-products of Hog

75, 76, 77, 155, Lard oil for miners' lamps.

See also Leather in this classification.

(d) Mutton

190 Fine wool Merino sheep grazing on range, Idaho. (Typical range sheep the world over.)
173 Shropshire, Oxford and Cotswold sheep in pasture, Ames, Iowa. (Choice mutton types.)
480 Shepherds and flocks on Argive plain, Greece.

For wool see section on Clothing in this classification also classification Textiles and Clothing.

(e) American Bison (Commonly called Buffalo)

232 Formerly an important source of meat supply.

(f) Deer

413 Reindeer. A meat supply of growing importance, now shipped from Alaska.
189 Elk, 2 Moose — fast disappearing species of deer family.

(g) Chickens, Ducks, Geese, and Pigeons

56 Chickens form an important meat supply.
401 Ducks along the canal in Holland, valuable for meat, eggs, and feathers.
216 Geese, for feather products, meat and eggs.
240 Pigeon farm — extensive "squab" production, Los Angeles.

(h) Hippopotamus

577 Hippopotamus — flesh much prized by natives.
578 Natives returning from hippopotamus hunt.

(i) Sea Foods

Codfish

13 Drying codfish in the sun, Gloucester, Mass.

Salmon

226 Netting salmon in the Columbia River, Oregon.
227 Butchering salmon, canning factory, Astoria, Oregon.
244 Indians drying salmon on the Yukon River, Alaska.

Sardines

531 Drying sardines on the beach, Beppu, Japan.

Oysters

97 Bedding for young oysters, Hampton, Va.
86 Shucking Oysters, Baltimore, Md.

Fishing in Finland

481 Fisher women selling fish in Finland market.

Seal

345 Seal blubber is an important article of diet in the Arctic and Antarctic regions. The oil is used for fuel and the skin for clothing and leather articles.

Whale

415 Whale blubber is used for food while the oil and bone form important articles of commerce.

3. INORGANIC PRODUCTS

Salt

42 Collecting, draining and hauling salt, Syracuse, N. Y.
153 Packing salt into barrels for shipment, St. Clair, Mich.
518 Conveying salt to the interior by wheelbarrow train, China.

B. CLOTHING

1. VEGETABLE PRODUCTS AND FACTORY PROCESSES

(a) Cotton

Growing

117 Picking cotton on a Mississippi plantation.
124 Hauling cotton to the cotton gin.
125 Cottin gin, Greenville, Texas.
119 Cotton in the bale ready for shipment, New Orleans, La.
420 Bales of cotton on wharf, Goteborg, Sweden.
286 Carding room, cotton mills, Orizaba, Mexico.
14 Spinning cotton yarn in textile mills, Lawrence, Mass.
15 Copying design on copper rolls for printing cotton cloth.
16 Printing room of cotton mills, Lawrence, Mass.
563 Primitive method of spinning cotton in Egypt.

Uses

For scenes showing uses of cotton see classification on Textiles and Clothing also Paper in this classification.

(b) Flax

268 Winding bobbins in linen mill, Canada.
269 Weaving the linen fabric, Canada.
40 Folding and ironing linen collars, Troy, N. Y.
See also Paper in this classification.

(c) Hemp

Manila (Abaca—native name)

552 Manila hemp — stripping the tree.
553 Primitive way of making hemp rope, Philippines.
99, 186, 188, 246, 295, 257, 342, 344, 217 Manila hemp rope in use.

Sisal

289 Henequen, from which sisal fiber is produced.
571 Sisal hemp plantation in blossom, Uganda, Africa.
357, 136 Show use of binder twine, made of sisal fiber in handling grain.

(d) Maguey

285, 287 Show the Maguey plant whose fiber is often used for the manufacture of clothing as well as twine rope, mats, sacks, carpets, etc. The tender heart of the plant can be cooked and eaten.

(e) Pina

108 Pineapple leaves from which pina cloth is made.
550 Philippinos wearing pina cloth.

(f) Bark Cloth

570 Peeling bark for making bark cloth, Uganda, Africa.

(g) Coconut Fiber

551 Coconut husk fiber for making cloth, mats, etc.

(h) Rubber

Sources

247 A rubber tree showing scars from cutting.
131 Many forms of crude rubber as it comes from the jungles.

Manufacture

133 Manufacture of rubber boots and shoes, Akron, Ohio.

Uses

46, 42, 227, 130, 161, 75 Rubber in boots.
See also Automobiles in this classification.

2. ANIMAL PRODUCTS AND FACTORY PROCESSES

(a) Wool

Sheep Raising

480 Merino sheep on the Argive plains in Greece.
173 Shropshire, Oxford and Cotswold sheep are often found on small farms as they are a better mutton type, being larger than the Merino, but the wool is coarser.
190 Fine wool Merino sheep, Idaho. (Typical range sheep the world over.)

Handling of Wool

145 Shearing sheep with power driven shears.
17 Sorting wool after cleaning and washing.

Modern Manufacturing Processes

18 Doubling frame in large woolen mill.
81 Spinning room — winding the bobbins, Phila.

Primitive Processes

409 Carding and spinning wool, Telemarken, Norway.
506 Spinning and weaving woolen shawls, Kashmir, India.

Uses

For use of wool in clothing see classification Textiles and Clothing.

(b) Silk

Silk Culture (Japan)

536 Silk worm incubator.
537 Gathering mulberry leaves for the silk worms.
538 Feeding mulberry leaves to the voracious young silk worms.
539 Silk worm cocoons in their nests.

Silk Manufacture (Japan)

540 Reeling silks from cocoons by hand.
541 One of Japan's largest modern silk weaving plants.

Silk Manufacture (America)

22 Weighing and sorting raw silk skeins, South Manchester, Conn. The United States buys approximately one-half the raw silk produced by Japan each year. We also buy heavily from China and Italy. Most of this silk comes to us as reeled silk.
23 First drawing or straightening of fibers — spun silk industry. South Manchester, Conn. This silk comes from damaged cocoons and is carded and spun in practically the same way as cotton and wool.
24 Roving frame — silk industry (spun silk), South Manchester, Conn.

53 Drawing warp for weaving silk cloth, Paterson, N. J. (Reeled silk).
54 Weaving room in the famous silk mills at Paterson, N. J.
55 Machines weaving dozens of fine taffeta silk ribbons, Paterson, N. J. For uses of silk in clothing see Classification on Textiles and Clothing.

(c) Leather

Sources

127 "Making a drive" on Paloduro Ranch, Texas.
186 Round up on Sherman Ranch, Kansas.
301 Cattle ranch in Jamaica.
317 Some of South America's famous cattle.
589 Range cattle in Australia.
185 Splendid Hereford cattle in Kansas feeding pens.
140 World's greatest live stock market, Chicago.
580, 298, 284, 561, 497, 454 Ox hide excellent leather.
159, 165, 57, 403, 364, 356, 371, 591, 403, 339 Dairy cattle finally furnish beef and leather.
549, 491, 474 Buffalo, a source of leather.
562, 545, 548, 510 Humped cattle of Asia.
71, 138, 218, 229, 195, 188, 182, 147, 136 Horses.
183, 172, 122 Pig skin a good leather.
560, 566, 567, 574, 557, 340, 524 Donkeys.
124, 249, 175, 311, 294 Mule skin an excellent leather.
190, 173, 480 Sheep skin much used for gloves, etc.
246, 279, 118, 190, 204, 396, 480 Dog skin used in many ways.
411, 447 Goats; 413 Reindeer; 2 Moose; 189 Elk; 335 Llama; 232 American Bison; 110 Alligator; 588 Kangaroo; 345 Seal; 505, 509 Elephants; 577, 578 Hippopotamus.

Manufacture.

272 Scraping hair from hides — tanning industry.
11 Skilled workmen cutting leather for shoes, Mass.
41 Sewing room, large shoe factory, Syracuse, N. Y.
12 Lasting machine, shaping shoes in Massachusetts shoe factory.

Uses

71, 138 Harness, a very important use of leather.
45, 14 Leather is also extensively used for belting.
98, 158, 182, 168, 169 Indians wearing "Buckskin" garments.
279, 413, 188, 224, 83, 77 Leather boots and shoes.
352, 89, 92 Leather upholstering.
188, 186, 182 Hog skin the usual leather for saddles.
507 Primitive use of inflated bullock skins for ferry boats.
285 Primitive use of hog skin to carry liquids.

(d) Furs

345 The seal, an important source of fur clothing.
343 The use of fur garments by the Eskimo.
328, 158 Indians using furs for clothing.
246, 243, 279 Use of fur caps and clothing, Arctic regions.
490 Natives of Asia Minor wearing fur caps and coats.

(e) Feathers

239 The ostriches supply beautiful ostrich plumes.
216 These geese furnish valuable feathers.

C. MINING AND MINERAL INDUSTRIES

1. ORGANIC DEPOSITS

(a) Anthracite Coal

74 Stripping coal at Hazelton, Pa.
75 Miners going into the slope, Hazelton, Pa.
76 Miner drilling and laborer loading "black diamonds."
77 Loading cage with car at bottom of shaft, Scranton, Pa.
78 Tandem automatic slate picker, Scranton, Pa.
79 Shipping coal, coal breaker in background, Ashley, Pa.

(b) Bituminous Coal

129 A trainload of bituminous coal from the Pittsburgh fields for Lake Superior consumption.
61 Coal on barges ready for river shipment. Pittsburgh, Pa., is sometimes called the Smoky City on account of the large amount of coal smoke from the various iron and steel mills and other great factories located there.
177 Bituminous coal used in threshing engine.
43, 26, 347 Bituminous coal used in passenger and freight engines and ships.

(c) Coke (Made from Bituminous Coal)

68 Coke ovens, loading coke into cars.
62 Two cars of coke at blast furnace.

(d) Peat (Irish Coal)

378 Peat from Irish bogs, High St., Killarney, Ireland.

(e) Petroleum

122 Spindle Top, an important oil region near Beaumont, Texas.
69 Filling shell with nitro-glycerin for shooting the well.
70 Shooting an oil well.
123 Crude oil stills and can factory, Port Arthur, Texas.
256 A reserve supply of the finished product in tank at the Panama Canal.

(f) Phosphate

115 Mining phosphate and loading cars, Tenn.—an important fertilizer.

(g) Asphalt

48 Barrels of asphalt shipped from mine, Trinidad Island.
316 Beautiful asphalt boulevard, Buenos Aires.

2. INORGANIC DEPOSITS AND INDUSTRIES

(a) METALS

(1) Iron

163 Steam shovel at work, Messabi Range, Minn.
164 Iron ore being loaded on ships, Two Harbors, Minn.
154 Ore ships passing through "Soo" Canal.
128 Unloading iron ore from ships to train for Pittsburgh District. (129 shows train load of coal which the ore ships will haul back to Minnesota.)
62 Iron blast furnace, Pittsburgh.
63 Modern pig iron machine at rest, Pittsburgh.
64 Emptying cooled pig iron from molds into car.

Uses

271 Iron pipe; 350, 354, 534, 306, 365 Iron fencing; 484, 485 Iron roof; 63, 64 Cast iron molds; 215, 471 Iron chains.

(2) Steel

116 Steel furnace, Birmingham, Ala.
61 Across the Monongahela River may be seen a steel plant in Pittsburgh.
65 Filling molds with steel, Pittsburgh.
66 Steel ingots on the "table" of the "blooming" mill, steel works, Pittsburgh, Pa.
67 Red-hot steel beam from rolling process being cut into lengths by buzz saw, steel works, Pittsburgh, Pa.

Usès

82 Erecting shop, Baldwin Locomotive works.
43 Two locomotives and a modern four track steel railway.
242 Steel in submarine; 254 battleship; 27, 174, 575 bridges; 139, 25, 26, 28, 30 skyscrapers; 1 axe; 224 saw; 69 drill; 256 wireless tower; 123 tanks; 170 power plant; 187 factory; 150, 151, 316, 305, 152 automobiles; 250, 252, 253 Panama Canal; 52 steam ships; 161, 166, 178, 179, 180 farm machinery and gas engines; 129, 128, 163 steel cars; 154, 164 freight boats; 177, 218 233 threshing engines; 84, 94 money making machines. For other uses of steel see classification on metals.

(3) Copper

187 Copper smelters and mines, Butte, Mont.
155 A mile underground — loading and handling cars with copper ore, Calumet-Hecla Mines, Calumet, Mich.
156 Pouring molten copper into ingot molds, Calumet, Mich.
157 Loading 1,400 tons of copper on boat, Houghton, Mich.

Uses.

15 Copper rolls for printing cotton cloth, Lawrence, Mass.
151 Insulated copper wires used in auto engines. 324, 486, 375, 273, 590 show trolley wires of copper.
308, 309 Show system of telephone wires, often of copper, especially the long-distance wires.
43 Showing copper telegraph wires.
171 Commutator plates in generators are copper.

(4) Brass (Product of Copper)

92, 84, 89, 21, 352 Brass lighting fixtures; 88, 92, 94 Brass fans; 494 Brass in rifle shells; 39, 37, 73 Cannon were formerly made of brass.

(5) Bronze (Product of Copper)

80 The old Liberty Bell. Most famous in world.
484 The great bell market, Nizhni Novgorod, Russia.
71 Small bronze bells on harness.
241 San Gabriel mission showing bells.

(6) Gold

243 Some of the 40,000 men who entered Klondyke gold field in 1898.
246 Gold miners and dog team north of Arctic Circle, Alaska.
245 Placer mining, near the Yukon River, Alaska.
225 Hydraulic mining, Oregon.
287 Rich gold and silver mining center, El Oro, Mexico.
579 Gold quartz mining, 10th level, 1,200 feet under ground, Robinson Mine, Johannesburg, S. Africa.
203 Stamp mill and gold concentrator, Ouray, Colorado.

Uses

21 Skilled workers manufacturing jewelry, Providence, R. I.

(7) Silver

214 A silver mining camp nestled in the mountains, Nevada.
287 Rich gold and silver mining center of El Oro, Mexico.
334 Refining silver in smelter, Peru, S. Amer.

Uses

33 Silverware in a well furnished dining room.
84 Silver half-dollars, quarters and dimes being coined at government mint.

(8) Zinc and Lead

176 Zinc and lead mines, Joplin, Mo.

(b) PRECIOUS STONES

(1) Diamonds

581 Mining "diamantiferous blue earth," Kimberley, S. Africa.

(2) Garnets, Rubies, Sapphires and Moonstones

512 Grinding gems — garnets, rubies, sapphires, and moonstones — Ratnapora, Ceylon.

(c) GLASS

Manufacture

134 Placing material in furnace, plate glass works, Rossford, Ohio.
135 Polishing plate glass after grinding, Rossford, Ohio.

Use

33 Cut glass on dining table, plate glass in mirror and mantel.
92 Glass in transom, lighting fixtures, ink wells, mirror, clock face and covering picture.
88 Glass in skylight.
587 Plate glass in Federal building, Melbourne, Australia.
159 Glass windows in modern dairy barn.
152 A well lighted modern factory building, Ford Motor Factory, Detroit.

(d) POTTERY

58 Firing tableware, Trenton, N. J.
59 Artists decorating porcelain ware, Trenton, N. J.
33 Finely decorated china on dining table.
372 Porcelain in Robert Burns' Cottage, Scotland.
542, 487, 572, 564, 292 Primitive pottery in other countries.

(e) QUARRYING

(1) Granite

3 Quarrying granite, Concord, N. H.— Drilling preparatory to splitting.
95 Congressional Library — white New Hampshire granite.
7 Quincy market building, Boston, built of granite.
6 Granite blocks used in paving.
569 The great dam, Egypt. Built of Assuan granite.
146 Lincoln Tomb (granite), Springfield, Ill.

(2) Marble

4 Marble quarry, Proctor, Vt., largest quarry opening in the world.
5 Chiseling marble, Proctor, Vt.

87 The extensions of the Capitol building are of Massachusetts marble.
36 Many marble monuments may be seen here.

(f) Nitrate

325 Sacking and shipping nitrate at mines, Chile.

3. LUMBERING AND FOREST PRODUCTS

(a) Lumbering

America

224 Felling great trees that grow in the rainy northwest.
162 Load of logs at Kettle River landing, Minn.
1 Landing and scaling logs, Aroostook Woods, Me.
215 Great chained log rafts, Columbia River, Washington.
216 Large lumber mills, near Seattle, Wash.
217 Loading ships with lumber.

Orient

509 Elephants hauling logs from Salwin River, Burma.
523 Chinamen sawing timbers in primitive way.

For uses of lumber see classification on Wood.

(b) Turpentine

107 Turpentine dippers and chippers at work, Savannah, Ga.
106 Savannah, Ga. Greatest turpentine market in world.

(c) Manufacture of Paper

For manufacture of paper from wood pulp, cloth and rice straw see Paper under Miscellaneous Industries, this classification.

(d) Charcoal

103 Burning charcoal, N. C.
543 Selling charcoal in Korea.

For further material on forest products and their uses see classification on Wood.

4. MISCELLANEOUS

(a) Haying

183 Alfalfa, principal hay and forage crop of West.
181 Handling alfalfa hay with hay loader.
185 Alfalfa hay in barn.
232 American bison eating hay in park.
388 Making hay, Highlands of Bavaria.
408 Hay put up in racks to cure.
454 A unique team eating hay, Naples, Italy.

(b) Ivory

505, 509 Elephants showing ivory tusks.
573 Shipping ivory at Mombaso, Africa.
577, 578 Ivory of hippopotamus inferior to that of elephant.

(c) Making Paper

Wood

1 Printing and wrapping paper are mainly made from wood pulp. Timber suitable for paper pulp is fast disappearing in the United States. Much paper pulp is imported from Canada.
412 Grindstones which convert the blocks into wood pulp for the manufacture of paper, Norway.

Cloth (Cotton and Linen)

19 Cut rags after removing from washing drums, paper mills, Holyoke, Mass.
20 Inspecting paper delivered by machine, Holyoke, Mass.
94 Paper money from linen rags — the toughest and most durable paper made in America.

Rice Straw

533, 534, 535, 536 Show rice paper used extensively by Japanese in the walls and windows of their homes.

(d) Making Money

84 Coining presses, Government, Philadelphia, Pa.
94 Making paper money, Washington, D. C.

(e) Tobacco

112 Kentucky tobacco field showing ventilated tobacco barns.
297 Cutting tobacco in Cuba.

(f) Irrigation

Irrigation is not a distinct industry. But because of popular interest in this method of production this grouping is supplied.

210 Great Roosevelt irrigation dam, Phoenix, Ariz.
198 Sugar beets in irrigated district, Colo.
104 Flooding the rice fields, S. C.
105 Hoeing rice, S. C.
234 Almond trees in irrigated district, Cal.
237 Some fine results of irrigating orange groves, Cal.
238 Orange blossoms and fruit, irrigated, Cal.
236 What irrigation does for Tokay grapes, Cal.
332 Preparing soil for planting, irrigated district, Peru.
333 Replanting sugar cane preparatory to irrigation, Peru.
549 Filipino harrowing rice field after irrigation.
527, 528, 529, 530 Irrigated rice fields, Japan.
515, 518 Irrigated land in China.

569 The great Nile Dam for irrigation purposes.
564 Land irrigated by overflow of Nile River, Egypt.
563 Cotton raised on irrigated land, Egypt.

(g) Rubber

247 Rubber tree showing scars from cutting, Panama.
131 Crude rubber from the jungles, Akron, O.
132 Building up an automobile tire, Akron, O.
155, 44 Rubber hose.

See also Rubber under Clothing in this classification.

(h) Automobiles

150 Assembling room, Cadillac plant, Detroit, Mich.
151 Experts testing motors, Cadillac plant, Detroit, Mich.
152 Employees leaving Ford plant, Detroit, Mich.
167, 305, 308, 315, 316 Automobiles in use.

For manufacture of Automobile tires see Rubber above.

(i) Construction

For a considerable range of industries dealing with the construction of highways, streets, bridges, canals, etc., see Part II of this classification, also Cities and the various classifications under Industrial Arts.

See classification on Transportation.

See classification on Markets and Marketing.

PART II

In the following scheme, the character of the work itself is made the basis for an economic classification of industries and products.

A. COLLECTIVE INDUSTRIES

These industries do not create anything which did not exist before, but collect raw materials, making only such changes in their form or qualities as are necessary to fit them for transportation and market. They may be carried on by primitive peoples and by the use of simple means or they may demand complex machinery and the exercise of the highest scientific skill.

1. PRIMITIVE

a. Plucking

551 Husking coconuts, Island of Luzon, P. I.
259 Luxuriant vegetation in the Mauna Loa Valley, Hawaii.
293 Golden and luscious mangoes, Nicaragua, C. A.
294 Harvesting bananas, Costa Rica, C. A.
303 Cacao pods, Dominica, B. W. I.

b. Fishing

226 Salmon Industry, Columbia River, Ore.
227 Interior of a salmon canning establishment, Ore.
244 Drying fish on the Yukon River, Alaska.
481 Fish wives of Finland — a busy scene on the quay.
531 Drying sardines on the beach, Beppu, Japan.
13 Drying codfish in the sun — Gloucester, Mass.
97 Oyster shells as bedding for young oysters, Hampton, Va.
86 "Shucking" oysters, Oyster House, Baltimore, Md.
415 Floating whale station, Spitzenbergen, Lapland. (Whales usually but incorrectly called fish.)
111 Sponge market, Key West, Harbor, Fla.

c. Hunting

2 Flashlight of wild moose in Maine forest.
577 Hippopotamus hunt, Rhodesia, Africa.
578 Returning from a big game hunt, Rhodesia, Africa.
345 Commander Adrien de Gerlache, leader of the Belgica expedition (1897-99) on skis hunting seals on South Polar pack.
110 Battle with a wounded 'gator, Palm Beach, Fla.
415 Floating whale station, Spitzenbergen, Lapland.

2. SCIENTIFIC

d. Lumbering

224 Method of felling trees, Oregon.
162 A load of logs, Minnesota Pineries.
1 Logs delivered at the stream, Me.
215 Great chained log rafts, Columbia River, Wash.
216 Largest lumber mills, near Seattle, Wash.
217 Shipping lumber, Washington.

e. Quarrying

4 Marble quarry, Proctor, Vt.— largest quarry opening in the world.
3 Quarrying granite, Concord, N. H.
5 Chiseling marble, Proctor, Vt.

f. Mining

Coal

74 Stripping coal at Hazelton, Pa.
75 Miners going into the slope, Hazelton, Pa.
76 Drilling and loading anthracite, Scranton, Pa.
77 Loaded cage at bottom of shaft, Scranton, Pa.
78 Tandem automatic slate picker, Scranton, Pa.
79 Shipping coal — coal breaker in background.

Petroleum

69 Filling shell with nitro-glycerin.
70 Shooting oil well with eighty quarts of nitro-glycerin, Pa.
122 Spindle Top oil region, Texas.
123 Crude oil stills and can factory, Texas.

Iron

163 Steam shovel at work, Mesabi Range, Minn.

Copper, Zinc and Lead

155 A mile underground — cars with copper ore, Mich.
176 Zinc and lead mines, Joplin, Mo.

Gold and Silver

245 Placer mining near the Yukon River, Alaska.
225 Hydraulic mining, Oregon.
579 Gold quartz mining, 10th level, 1,200 feet under ground, Johannesburg, South Africa.
334 Refining silver in smelter, Cerro de Pasco, Peru.
214 A mining camp nestled in the mountains, Nevada.

Diamonds

581 Taking out the "diamantiferous blue earth" at Wesselton diamond mines, Kimberley, South Africa.

Phosphate

115 Mining phosphate near Columbia, Tenn.

Nitrate

325 Sacking and shipping nitrate at mines, Chile.

g. Collecting

130 Tapping a sugar-maple tree, Ohio.
107 A turpentine farm — dippers and chippers at work, Savannah, Ga.
247 Rubber tree, showing scars from cutting, Panama.
131 Many forms of crude rubber, Akron, Ohio.
285 Filling pig skins with juice from maguey plant used in making pulque, the native drink, Tacuba, Mexico.

B. PRODUCTIVE INDUSTRIES

These industries assist nature to multiply or create materials which would not otherwise exist and are capable of a high degree of scientific development.

3. AGRICULTURE

h. Garden Culture

149 Harvesting celery, Kalamazoo, Mich.
47 Harvesting cantaloupes near Buffalo, N. Y.

83 School gardens, Philadelphia, Pa.
235 Luther Burbank's spineless cactus, Santa Rosa, Cal.
211 Spineless cactus — a valuable product for semi-arid regions, New Mexico.

i. Field Culture

Grains

561 Tilling the soil as in ancient days, Egypt.
522 Chinese farmer boys plowing, near Port Arthur.
488 How the Russian peasant tills his fields.
178 Plowing with tractor, South Dakota.
179 Harrowing with tractor, South Dakota.
180 Manure spreader followed by tractor plow. Sod near Omaha, Nebr.
357 Harvesting wheat in Old England.
199 Wheat raised by the "dry farming method."
147 Loading oats in the field, Ill.
218 Combined reaper and thresher, Wash.
233 Steam Harvester, reaping, threshing and sacking wheat.
497 The threshing floor of Nazareth, Palestine.
479 Treading out the grain, Greece.
284 Ancient mode of threshing in Mexico.
562 Threshing beans in the field, Egypt.
177 Threshing wheat, North Dakota.
184 Corn field, Kansas.
160 Harvesting and loading silage corn, Wis.
136 Modern methods in corn harvesting, Ind.
137 Corn in the shock, Ind.
549 Filipino farmers harrowing rice fields.
528 Rice planters at work, Japan.
527 Overlooking the rice fields, Japan.
529 Rice harvest, cutting with a sickle, Japan.
105 Hoeing rice, South Carolina.
104 Flooding the rice fields, S. C.
550 Hulling rice for breakfast, P. I.

Sugar Beets

198 Cultivating a field of beets, Colorado.
419 Women working in a field of sugar beets, Sweden.

Tobacco

112 Tobacco field in Kentucky.
297 Cutting tobacco grown in the shade of banana trees, province of Havana, Cuba.

Peanuts

118 Harvesting peanuts, Marianna, Arkansas.

Potatoes

166 Potato digging machines, Moorhead, Minn.

Hay

181 Handling alfalfa hay with hay loader.

j. Plantation Culture

Sugar Cane

332 Preparing soil for planting sugar cane, Peru.
333 Replanting the sugar cane, Peru.
258 Cutting the sugar cane, Porto Rico.

Fruits

294 Harvesting bananas, Costa Rica, C. A.
108 Harvesting pineapples, Florida.

Fibers

117 Picking cotton on a Mississippi plantation.
289 Henequen producing sisal hemp fiber, Mex.
571 Sisal hemp plantation in blossom, Uganda, Africa.
552 Manila hemp, stripping the tree, P. I.

k. Horticulture

44 Summer spraying in apple orchard, N. Y.
175 Sorting and packing apples in barrels, Mo.
85 Gathering peaches, Delaware.
237 10,000 acres of orange groves, Cal.
238 Orange blossoms and fruit, Los Angeles, Cal.
437 Picking Valencia oranges, Spain.
236 Tokay grapes, Acampo, Cal.
390 Toiling in the vineyards, Rudesheim, Germany.
319 Italian settler and family, vineyards in background, Mendoza, Argentina.
234 Harvesting almonds, Cal.
302 Coffee pickers, Guadelqupe, F. W. I.
310 Method of drying coffee, Sao Paulo, Brazil.
530 A country girl of old Japan — among the famous tea fields of Shizuoka, Japan.
303 Cacao pods, Dominica, B. W. I.

l. Herding — depends on native grasses, mosses, etc.

Cattle

127 On the Paloduro Ranch, Paloduro, Tex.
186 Round up on the Sherman Ranch, Geneseo, Kan.
188 Cowboy, bronco corral and camps, Mont.
301 A cattle ranch in Jamaica, B. W. I.
317 Argentina's famous cattle, La Plata, Argentina, S. A.
589 Range cattle, Australia.

Sheep

190 Sheep grazing on range, Idaho.
480 Shepherds and their flocks, Greece.

Reindeer

413 Laplanders milking the reindeer, Norway.

m. Stock raising is combined with agriculture and depends on home-grown grain and fodder.

Cattle

364 Jersey cattle.
371 Ayrshire dairy cattle, Scotland.
403 Milking Holstein-Friesian cattle, Holland.
159 Modern dairy barns and Holstein cattle, Wisconsin.
57 Milking scene in modern dairy, New Jersey.
358 Whitefaced Herefords.
370 Aberdeen Angus, a noted breed of beef cattle.
183 Hereford cattle in Kansas feeding pens.
140 The world's greatest live stock market, Chicago.

Swine

172 Hogs in rape pasture, Iowa.
183 Hogs in rich alfalfa pasture, Kansas.

Sheep and Goats

173 Shropshire, Oxford and Cotswold sheep.
411 Milking the goats, Hardanger Fjord, Norway.
447 Grindewald on market day, Switzerland.

Horses

138 A champion team of Percheron draft horses.
398 Belgian draft horses.

Elephants

509 Elephants hauling logs from river, Burma.
505 Stately elephants on parade, Jaipur, India.

Birds

56 1,500 Hens (White Leghorns) in laying house, New Jersey.
240 Los Angeles pigeon farm, California.
239 Cawston ostrich farm, California.

Insects

537 Gathering mulberry leaves for silk worms, Japan.
536 Silk worm incubator, Japan.
538 Feeding mulberry leaves to silk worms. Japan.
539 Silkworm cocoons, Kiryu, Japan.

C. CONSTRUCTIVE INDUSTRIES

These industries use all sorts of materials supplied by the collective and productive industries in the construction of things which are largely artificial.

4. MANUFACTURING

The United States Census publishes statistics of 259 distinct lines of manufacture and the number of different kinds of articles produced runs into the tens of thousands.

Foodstuffs

292 Tortilla making, Salvador, C. A.
498 Native women grinding wheat, Palestine.
410 "Flat Bread" of the Norwegian Peasant.
45 1,000 lbs. of freshly churned butter, N. Y.
270 Beets stored in sheds at sugar factory.
271 Beet pulp and juice for manufacturing sugar.
34 Conveyor with trays of loaf sugar.
35 Filling and sewing bags of granulated sugar.
141 Dressing beef — washing with boiling water.
143 Trimming and skinning hams before pickling.
142 Splitting backbones and inspection of hogs.
144 Making link sausages.

Fibers and Textiles

For more complete list see Clothing in this chapter, also classification on Textiles and Clothing.

Cotton

563 Native boys spinning cotton, Egypt.
286 Carding room, cotton mills, Mexico.
14 Spinning cotton yarn, Lawrence, Mass.
15 Copying design on copper rolls for printing cotton cloth, Lawrence, Mass.
16 Printing room of cotton mills, Lawrence, Mass.

Linen

268 Winding bobbins in linen mill, Canada.
269 Weaving the linen fabric, Canada.

Wool

17 Sorting wool, Lawrence, Mass.
409 Carding and spinning wool, Norway.
506 Spinning and weaving woolen shawls, Kashmir, India.
81 Spinning room, winding bobbins with woolen yarn for weaving, Philadelphia, Pa.
18 Doubling frame in a large woolen mill.

Silk

540 Reeling silk from cocoons, Kiryu, Japan.
22 Weighing and sorting raw silk skeins, Conn.
23 First drawing of fibers, Conn.
24 Spinning — silk industry, Conn.

53 Drawing warp, silk mills, Paterson, N. J.
54 Weaving room, silk mills, Paterson, N. J.
55 Machine weaving taffeta silk ribbons, Paterson, N. J.
541 One of Japan's largest silk mills.

Bark

570 Peeling bark for making bark cloth, Uganda, Africa.

Cordage

553 Manila hemp rope factory, Philippines.
289 Henequen, source of sisal hemp fiber, Mex.
571 Sisal hemp plantation, Uganda, Africa.

Leather Boots and Shoes

272 Scraping the hair from the hides, Canada.
11 Skilled workmen cutting leather for shoes, Mass.
12 Lasting machine shaping shoes, Mass.
41 Sewing room — large shoe factory, Syracuse, N. Y.
133 Manufacture of rubber boots and shoes, Akron, Ohio.

Fuel

103 Burning charcoal, North Carolina.
68 Making coke from bituminous coal, Connellsville, Pa.

Iron and Steel

62 Plant of the blast furnace, Pittsburgh, Pa.
116 Steel furnace, Birmingham, Ala.
63 Modern pig iron machine, Pittsburgh, Pa.
64 Emptying pig iron from molds into car, Pittsburgh, Pa.
65 Filling molds with steel, Pittsburgh, Pa.
66 Steel ingot on the "table" of the "blooming" mill, Pittsburgh, Pa.
67 Red-hot steel beam being cut into lengths by buzz saw, Pittsburgh, Pa.

Copper and Gold

187 Copper smelters and mine, Butte, Mont.
156 Pouring molten copper into ingot molds, Mich.
203 Stamp mill and gold concentrator, Colorado.
84 Coining presses, Government Mint, Philadelphia, Pa.

Jewelry

21 Manufacturing jewelry, Providence, R. I.
512 Grinding gems, garnets, rubies, sapphires and moonstones, Ratnapora, Ceylon.

Salt

42 Solar method of evaporating salt brine — collecting, draining and hauling salt, Syracuse, N. Y.
153 Packing salt into barrels for shipment, St. Clair, Mich.

Glass and Pottery

134 Method of placing material in furnace, plate glass works, Rossford, O.
135 Polishing plate glass after grinding, Rossford, Ohio.
58 Firing tableware, Trenton, N. J.
59 Artists decorating porcelain ware, Trenton, N. J.

Machinery

156 Pouring molten copper into ingot molds, Calumet-Hecla Mines, Calumet, Mich.
151 Experts testing engines in the Cadillac automobile plant, Detroit, Mich.
82 General view of the erecting shop, Baldwin Locomotive Works, Philadelphia, Pa.

Wood Pulp and Paper

412 Grindstones which convert the blocks into wood pulp, paper mills, Skotifos, Norway.
19 Cut rags after removing from washing drums — paper mills, Holyoke, Mass.
20 Inspecting paper delivered by machine, Holyoke, Mass.
94 Making paper money, Bureau of Printing and Engraving, Washington, D. C.

5. BUILDING

Consists in the erection of large, permanent structures such as houses, ships, bridges, etc. A great variety of materials is used and workmen of many trades are employed, as masons, carpenters, painters, plumbers, etc.

6. ENGINEERING

The most complex and technical of all industries, has many branches, closely related to manufacture and building. It plans and constructs engines, machinery, power plants, mills, water works, dams, bridges, tunnels, irrigation, drainage and sewer system, roads, docks, canals and the very largest works of human design. By means of engineering, the great powers of nature, heat, water, wind and electricity are brought into the service of man.

Architecture

(See classification on Architecture)

Shipbuilding

52 Great ocean liners at the docks, Hoboken, N. J.
100 Warships in Hampton Roads, Va.

242 Submarines, battleships and torpedo boats, San Diego Bay, Cal.
280 Mexico's principal harbor, Vera Cruz.
314 Entrance to the harbor, Buenos Aires, Argentina.
394 Zeppelin flying over a German town.
511 Colombo Harbor from landing jetty, Ceylon.

Dams and Power Plants

148 Building dikes, East St. Louis, Ill.
170 Power dam and locks in Mississippi River, Keokuk, Iowa.
171 Fifteen large generators in a row, supplied with power from the great dam at Keokuk, Iowa.
210 Roosevelt irrigation dam near Phoenix, Ariz.
569 Irrigation dam, Assuan, Egypt.

Bridges

27 The great Brooklyn bridge, New York.
101 Harpers Ferry, West Virginia.
174 Eads Bridge, St. Louis, Mo.
348 London Bridge over the Thames, England.
366 Great Forth Bridge, Queensferry, Scotland.
375 Patrick's Bridge, Cork, Ireland.
379 Suspension bridge, Kenmare, Ireland.
392 Bridge over the Rhine at Bonn, Germany.
416 The Vassar bridge, Stockholm, Sweden.
442 The Kapellbrucke, Lucerne, Switzerland.
456 Florence and River Arno, Italy.
470 Railway bridge over the Danube, Czernavoda, Roumania.
500 The Howrah bridge over the Hooghly River, Calcutta.
575 Bridge near Victoria Falls, Africa.

Roads

31 Many forms of transportation required in large centers of population, New York City.
43 Four track railway, electric road, and Erie Canal.
71 Conestoga wagon on good dirt road.
330 Cofa Bridge on the Oroya railway, Peru.
440 To the Clouds by rail — Mt. Pilatus, Switzerland.

Canals

48 Mouth of Erie Canal, Buffalo, N. Y.
154 Greatest canal traffic in the world, the "Soo" Canal.
250 Excavating at site of Gatun Locks, Panama.
251 Excavations measuring 500 feet deep in Gaillard Cut, Panama.
252 North over Gatun Locks, Panama.
253 South over Gatun Locks and Gatun Lake, Panama.
254 *U. S. S. Missouri* in the Panama Canal.
256 At the Pacific entrance of the Panama Canal.

405 Frederiksholms Canal, Copenhagen, Denmark.
457 Grand Canal, Venice, Italy.
462 Danube Canal in the very heart of Vienna.
559 The Suez Canal from a German liner.

Docks

106 Along the wharf of Savannah River, Ga.
128 Unloaders at work on ore docks, Conneaut, Ohio.
164 Looking between ore docks # 2 and # 3, Two Harbors, Minn.
267 The wharves, Montreal, Canada.
347 Landing stage, Liverpool, England.
400 Steamer docks, Rotterdam, Holland.
420 Custom House scene and harbor, Goteborg, Sweden.
429 The Cathedral, near busy docks, Marseilles, France.
433 Commodious harbor of Barcelona, looking towards the Columbus monument and Custom House, Spain.
556 Harbor of Algiers, Algeria.

For more complete list see Harbors in Transportation classification, also Markets and Marketing classification.

D. DISTRIBUTIVE INDUSTRIES

These industries are concerned with the circulation or movement of people, goods, and ideas. They are dealt with in the chapters on Transportation and Markets and Marketing.

4. TRANSPORTATION

COMMERCIAL GEOGRAPHY

By EMERY R. JOHNSON, Ph.D., Sc.D.

PROFESSOR OF TRANSPORTATION AND COMMERCE, UNIVERSITY OF PENNSYLVANIA

By means of transportation men secure the necessities of life from the farmers, manufacturers and other producers. Goods become useful to those who need them after they have been carried from the producer or makers to those who use the articles. In different countries and different parts of the world various methods of moving goods from place to place are employed. There is still a surprising amount of carrying done by men and women and beasts of burden without the use of any kind of a vehicle. In those countries where the people have enough wealth to enable them to use vehicles, many varieties of mechanical instruments of transportation have been devised. Less advanced people use simple two-wheeled carts drawn by one or more horses or mules, or sometimes by cattle, water buffalo, camels, dogs or reindeer. Each country uses draft animals that can live and flourish in the particular country in question.

I. HUMAN CARRIERS

We who live in the United States have become so accustomed to passenger and freight trains, auto trucks, automobiles, dray wagons and comfortable carriages that we have some difficulty in realizing that there are people in Asia, Africa, and the Philippine Islands who depend upon their own muscular strength for transportation and travel; but if we were to visit Korea we would see men carrying heavy burdens on their back, as is shown by the view (543) of the charcoal carriers, or if we were to visit Porto Rico (view 257) we would see women carrying on their heads packages weighing as much as possibly 50 lbs. It is only when we go on camping trips to fish or to climb mountains that we resort to "packing," but in some countries this is the regular method of transporting articles.

A. Burdens Borne on Head

257 Porto Rico woman carrying burden on the head.
437 Carrying basket of oranges near Valencia, Spain.
542 Korean carrying earthen vessel on head.
564 Egyptian carrying water jar on head.
572 South African natives carrying baskets on head.
578 African natives carrying burdens on head.
504 Natives carrying water jars on head, Jaipur, India.

B. Burdens Borne on Back

243 Miners carrying supplies on back over Chilcoot Pass.
328 Indians carrying children on back, Chile.
449 Carrying goods up mountain trails, Switzerland.
473 Carrying basket on back, Constantinople.
507 India natives carrying inflated bullock skins.
532 534 Japanese mother carrying child on back.
542 White robed pottery peddler, Seoul, Chosen.
543 Koreans carrying charcoal on back.
530 Japanese carrying basket of tea leaves.

C. Burdens Borne on Shoulders

108 Carrying baskets of pineapples on shoulders, Florida.
175 Carrying basket of apples on shoulder, Missouri.
266 Fifth Royal Highlanders carrying rifles on shoulder.
327 Laborer carrying box on shoulder, Valparaiso, Chile.
463 Carrying burdens on shoulder, Vienna, Austria.
487 Dairy maids carrying milk on shoulder, Kief, Russia.
494 Arab carrying gun on shoulder.
513 521 Chinese carrying burdens on shoulder.
585 American and British troops carrying guns on shoulder.

D. Burdens Borne by Hand

46 Carrying box of milk bottles.
47 Picking and loading cantaloupes near Buffalo.
69 Filling shell with nitro-glycerin.
182 Mounted Sioux Indians carrying spears and guns.
258 Cutting and carrying sugar cane, Porto Rico.
261 Honolulu musicians, Hawaii.
516 Chinese pulling huge stone roller, Nanking.
518 Conveying salt by wheelbarrow train, China.
531 Japanese carrying tray of sardines.
544 Russian traveler carrying baggage in hand.
555 Arab carrying water, Tangier, Morocco.
513 "Queen's Road" Hong Kong, China.

II. TRANSPORTATION BY ANIMALS

In countries where there are only trails instead of roads, articles have to be transported by human carriers or by pack animals. As is shown by the views, different countries use different kinds of animals for beasts of burden. Not only horses and mules, but also cattle, elephants and camels have their "packing" to do.

In large cities, automobiles and electric cars now do most of the work that was formerly performed by horses, and to an increasing extent farmers as well as miners and lumbermen are using the automobile engine instead of the mule or horse to haul and carry commodities; but, for the most part, the farmer still uses the horse or mule to haul his wagon and to do the hard work of farming. The different kinds of carts and wagons used in different countries and the various kinds of saddle and draft animals are well illustrated by the views listed in the following classification.

A. Horses

Horseback

182 Mounted Sioux Indians leaving camp, Nebraska.
193 Mounted guard, Yellowstone National Park.
186 Cowboys rounding up cattle, Kansas.
188 Cowboys roping their mounts, Montana.
204 Ute Indian and family, Colorado.
333 Inspecting sugar cane plantation near Lima, Peru.
385 Cuirassier guards on parade, Berlin.
464 Mounted officer, Andrassy Strasse, Budapest.
496 Horseman on Jericho road, Palestine.
494 A sheik and his body guard, Syria.
585 Officers reviewing troops, Sydney, Australia.
315 Officers on horseback, Buenos Aires.

Horses with Wagons

7 Market and delivery wagons about Boston Market, Mass.
42 Hauling salt, Syracuse, N. Y.
47 Loading cantaloupes near Buffalo.
71 Wagon that carried ammunition to Perry, 1813.
138 Champion team of Percheron draft horses.
147 Hauling oats, Illinois.
149 Hauling celery, Kalamazoo, Mich.
167 Dray wagon on Nicollet Avenue, Minneapolis.
177 Hauling grain to thresher, North Dakota.
181 Hauling hay near Lincoln, Nebraska.
195 221, 229 Stage coaches hauling passengers.
273 Main street, Winnipeg, Canada.
406 A busy street scene, Copenhagen, Denmark.
420 Hauling freight, Goteborg, Sweden.
454 Hauling on the streets of Naples, Italy.

473 A busy street scene, Constantinople, Turkey.
484 Great bell market, Nizhni, Novgorod, Russia.

Horses with Farm Machinery

44 Summer spraying in apple orchard.
136 Modern methods in corn harvesting, Ind.
160 Harvesting and loading silage corn, Wis.
166 Potato digging machines at work, Minn.
180 Manure spreader followed by tractor, Nebr.
198 Cultivating field of sugar beets, Colo.
218 Twenty horses pulling combined reaper and thresher.
357 Harvesting wheat in old England.
488 Plowing with primitive native plow, Russia.

Horses with Carriages

201 Cathedral Spires, Garden of the Gods, Colorado.
209 Light driving rig in desert, Arizona.
312 Carriage team, Montevideo, S. A.
320 High wheeled cart and gig, Argentina.
349 Hansom cabs, London, England.
383 Cab drivers, Berlin.
424 Carriages, Paris, France.
472 Carriages, Constantinople, Turkey.
547 Calle Real, principal street of walled city, Manila.
560 Carriages on great Nile bridge, Egypt.

Horse Cars

473, 474 Horses pulling street cars, Constantinople.

Horses with Sleigh

162 Hauling logs in Minnesota.

Horses Drawing Fish Nets

226. Pulling salmon nets with horses, Columbia River.

Horse as Pack Animal

537 Gathering mulberry leaves in Japan.

B. Donkeys

340 Donkey used as saddle animal, Venezuela.
341 City baker making his daily rounds, Caracas.
378 Donkeys hauling peat, Killarney, Ireland.
496 Russian pilgrims riding donkeys, Jericho road, Palestine.
522 Chinese plowing with donkeys.
524 A donkey pack train, North China.
557 Outside the fine gate, Bab-el-Hathera, Tunis.
560 Donkey pack animals on great Nile bridge.
566. Tigran Bey on his mount, Sakkara, Egypt.
567 The donkey as saddle animal, Thebes, Egypt.

C. Mules

124 Mule team hauling cotton.
175 Hauling apples with Missouri mule team.
249 The mule a good draft animal in warm countries.
294 Mule used as pack animal, Costa Rica, C. A.
311 Mules hauling coffee, Sao Paulo, Brazil.
438 Spanish mules hitched in tandem fashion.
479 Primitive use of mule in Greece.

D. Cattle

Common Ox

580 Oxen used to transport army supplies, South Africa.
298 Cattle used for farming in Province of Havana, Cuba.
284 Cattle used for threshing grain, Mexico.
561 Cattle plowing primitive way in Egypt.
337 Ox cart, Baranquilla, Colombia, South America.
497 Oxen working on threshing floor, Nazareth, Palestine.
454 Ox and horse hitched together, Naples, Italy.

Buffalo

549 Buffalo much used by the Filipino farmer.
491 Shoeing buffalo on streets of Tarsus, Syria.
474 European buffalo yoked for heavy hauling, Constantinople.

Humped Cattle of Asia

562 Humped cattle threshing beans, Egypt.
545 Fancy Japanese cattle at bull races, Java.
548 Humped cattle as pack animals and for riding.
510 Humped cattle hauling pleasure party, Burma.

Dairy.

339 Native method of distributing milk unadulterated.

E. Dogs

246 Gold miners and dog team, Alaska.
279 Eskimo dog team, Hopedale, Labrador.
396 Dog drawing milk cart, Antwerp, Belgium.

F. Camels

565 A camel at the Sphinx, Egypt.
564 Camel at the river Nile.
504 Caravan entering Jaipur, India.

G. Llamas

335 Llama used as beast of burden in South America.

III. CANAL AND RIVER TRANSPORT

A. Rafts

ong before the railroad was invented, the rivers and
d for transporting freight and passengers. The lum
rafts of logs down the river in the spring when the s
)d; but in the eastern part of the United States and
ississippi River there is little rafting at present as comp
t; but one may still see (view 215) enormous rafts o
umbia River and on some other western waters.

Logs delivered at the stream ready for rafting, Me.
Great chained log rafts on the Columbia River.
Inflated bullock skins for rafts, Sutlej River, India.

B. Row Boats, Canoes, and Yachts

ow boats and canoes are, for most of us, at the prese
r for pleasure or amusement. Our ancestors used tl
yday business life, and the people of China and Jap
e use of hand propelled boats for business purposes.

Indian canoe. "From the wigwam he departed."
Sailing boats and yachts, Valparaiso, Chile.
Sailing boats and yachts, Cannes, France.
Row boats and motor boats on Grand Canal, Venice.

C. House Boats

House boats on the Pasig River, Manila

154 Ships passing through "Soo" Canal.
252 Ship passing through Gatun locks, Panama Canal.
253 Gatun Lake showing Panama Canal shipping.
462 Fishing boats on Danube Canal, Vienna, Austria.
559 Sail boat and German liner on Suez Canal.

E. Canals

For the present and the future the large inland canal, like the Erie Canal connecting Albany with Buffalo, or an interoceanic canal like the one at Panama or the one at Suez, is the kind required for the work to be done.

154 Greatest canal traffic in world, Mich.
252 Atlantic entrance to Panama Canal.
253 South over Gatun locks and Gatun Lake.
254 *U. S. S. Missouri* passing through Panama Canal.
256 Pacific entrance of the Panama Canal.
399 Water Street, Zaandam, Holland.
400 Steamer docks, Rotterdam, Holland.
405 Frederiksholms Canal, Copenhagen, Denmark.
457 Grand Canal, Venice, Italy.
462 Along the Danube Canal, Vienna, Austria.
559 The Suez Canal from a German liner, looking north.

F. River Steamers and Barges

The principal rivers of every country will always be great arteries of commerce. Fifty years ago the river steamboat was more largely used than it is today, because the railroad has taken over much of the work that the steamboat used to do. With the growth of population and with the increase in the amount of transportation work to be done, river steamboats and barges are again needed and we are seeing a revival of the use of the rivers as highways of commerce.

61 River craft, Pittsburgh, Pa.
119 Large river steamboats, New Orleans.
267 River barges and ocean steamers at Montreal.
429 Loaded barges, Marseilles, France.
433 Barcelona harbor showing loaded barge.
462 Along Danube Canal in Vienna.
467 River dock, Belgrade, Servia.
472 The famous Galata bridge, Constantinople.
473 Stamboul end of Galata bridge.
546 House boats on the Pasig River, Manila.

G. Sail Boats on Rivers

27 Sail boats under the great Brooklyn bridge, N. Y.
39 Sail boats on Hudson River above West Point.
106 Sail boats along the wharf of Savannah River.
396 Antwerp, Belgium, sail boats at river wharves.

H. Ferry Boats

26 Ferry boat and water front of New York City.
32 Ferry boat landing passengers, Ellis Island, N. Y.
386 Ferry boats, Hamburg, Germany.

I. River Highways of Commerce

The views here listed of river steamboats and river highways give an excellent idea of the use and possibilities of river transportation.

51 Palisades of the Hudson River, looking north.
61 Confluence of the Allegheny and Monongahela Rivers.
120 In the Mississippi Delta at Head of Passes.
170 Great Keokuk Power Dam and Locks in the Mississippi.
264 St. Lawrence River from Dufferin Terrace, Quebec.
383 The Reichstags-Gebaude, Berlin, Germany.
391 Traffic on the Rhine, Bingen, Germany.
392 Great bridge over Rhine, Bonn, Germany.
397 River Meuse, Namur, Belgium.
467 Junction of Save River with the Danube.
471 On the bank of the Danube, Roumania.
482 Vasili Island, Petrograd, Russia.
483 The Kremlin, Moscow, Russia.
489 Looking up Bosporus toward Black Sea.
501 Pilgrims bathing in the sacred Ganges.
517 China's great river Yangtze.
564 Inundation of the Nile, Egypt.
507 A primitive raft on Sutlej River, India.

IV. LAKE TRANSPORTATION

A. Steamers

The United States and Canada have, in the five great lakes — Ontario, Erie, Huron, Michigan and Superior — the longest and best lake highway of the world. The traffic passing through Sault Ste. Marie Canal connecting Lake Michigan with Lake Superior exceeds the traffic of any other canal in the world.

48 Lake steamers at mouth of Erie Canal.
164 Ore boats loading, Two Harbors, Minn.
154 Passenger, freight and ore boats, "Soo" Canal.
128 Lake steamers unloading at ore docks, Conneaut, O.
459 Small passenger steamer on Lake Como, Italy.

B. Docks

The freight steamers on the Great Lakes and the docks and other terminal facilities of the lake ports exceed in size and efficiency those of any other lakes in the world.

48 Lake Erie docks at mouth of Erie Canal.
128, 129 At work on the ore docks, Conneaut, O.
157 Loading 1400 tons of copper, Houghton, Mich.
164 Ore docks No. 2 and No. 3, Two Harbors, Minn.
154 Locks and docks of "Soo" Canal.
253 South over Gatun Lake, Panama Canal.
459 Beautiful Lake Como and docks, Italy.

V. OCEAN TRANSPORTATION

A. Ports

Most of us are more interested in the great ocean vessels and in the busy scenes about the wharves and docks at New York and other great ocean ports than we are even in railroads or in lake steamers. Ocean transportation is very well illustrated by the many views listed in the classification that follows. By studying these views, boys and girls who have never visited an ocean port may get a very good idea of ships and harbors and of the business of ocean transportation.

25 Statue of Liberty and New York Harbor.
26 Ferry slips and water front of New York City.
27 The great Brooklyn bridge, New York.
32 Immigrants landing from barge, Ellis Island, N. Y.
52 Great ocean liners at docks, Hoboken, N. J.
106 Along wharf of Savannah River, Savannah, Ga.
248 City and Bay of Panama, from Ancon Hill.
257 Overlooking harbor, San Juan, Porto Rico.
277 Canadian Pacific station and dock, Vancouver, B. C.
278 Harbor and St. Johns, New Foundland.
280 Mexico's principal harbor, Vera Cruz.
299 Santiago and harbor from Spanish block house.
304 Lower city and harbor, Bahia, Brazil.
314 Entrance to harbor, Buenos Aires, Argentina.
326 The harbor and city, Valparaiso, Chile.
374 Queenstown Harbor, Ireland.
433 Commodious harbor of Barcelona, Spain.
492 Bird's-eye view of Beirut, Syria.
499 Madras and harbor, India.
511 Colombo harbor from landing jetty, Ceylon.
514 Harbor scene, Hong Kong, China.
556 Harbor of Algiers, Algeria.

B. Wharves and Docks

52 Great ocean liners at Docks, Hoboken, N. J.
267 The wharves, Montreal, Canada.
277 Canadian Pacific terminal, Vancouver, B. C.
280 Mexico's principal harbor, Vera Cruz.

295 Havana wharf, Cuba. Unloading coffee from Porto Rico.
327 Goods arriving at docks for shipment, Valparaiso, Chile.
347 Landing stage, Liverpool, England.
420 Custom house scene and harbor of Goteborg, Sweden.

C. Sailing Ships

The sailing vessel which fifty years ago carried most of the freight that moved on the ocean is now used to a small extent as compared with steamers, but fishermen, lumbermen, and some others who "go down to the sea in ships" still find the sailing vessel very useful and well adapted to their needs.

111 Sail boats at Key West harbor, Florida.
216 Sailing ships at mill for load of lumber.
217 Shipping lumber, Washington.
257 Sail boats at San Juan harbor, Porto Rico.
278 Fisherman's quarters, harbor at St. Johns, N. F.
295 Sail boats at Havana wharf, Cuba.
342 Peary's ships, *Windward* and *Eric,* equipped with sails.
344 *Belgica,* Antarctic ship, equipped with sails.
347 Sailing ship in Liverpool harbor, England.
473 Sailing ships at Constantinople.
481 Fish wives of Finland — A busy scene on the quay.
525 Small coastwise sailing vessels, Japan.

D. Steamers

26 Water front of New York City.
52 Great ocean liners at docks, Hoboken, N. J.
106 Along the wharf of Savannah River, Savannah, Ga.
252 North over Gatun locks and canal.
253 A busy scene on the Panama Canal.
257 Overlooking harbor, San Juan, Porto Rico.
267 Ocean liners, Montreal, Canada.
277 Burrard inlet, Vancouver, B. C.
280 Ocean freight steamer, Vera Cruz.
299 Santiago and harbor from Spanish block house.
314 Freight and passenger steamers, Buenos Aires.
342 The twin ships, *Windward* and *Eric* — Peary expedition.
344 Hauling snow for water, Belgica Antarctic expedition.
347 Landing stage Liverpool, England.
374 Queenstown harbor, Ireland.
415 Floating whale station, Spitzenbergen, Lapland.
420 Harbor of enterprising city, Gothenburg, Sweden.
433 Commodious harbor of Barcelona, Spain.
473 Steam ships in harbor, Constantinople, Turkey.
492 Harbor of Beirut, Syria.
499 Madras and harbor, India.
511 Steam ships at anchor, Colombo harbor, Ceylon.

514 Harbor of Hong Kong, China.
556 Harbor of Algiers, Algeria. Ocean steamers.
559 German liner in Suez Canal.

E. Battle ships, Submarines and Torpedo Boats

100 U. S. Battleship fleet in Hampton Roads.
254 *U. S. S. Missouri,* first battle ship through Panama Canal.
242 Submarines, torpedo boats and battle ships.

VI. RAILROAD TRANSPORTATION

Every boy and girl is acquainted with the railroad, but not every one has seen how roads are built up high mountains or how railroad trains are carried on great bridges across broad rivers. Railroads are of many kinds and so are cars and trains. There is a different kind of car for each of the important kinds of traffic; the refrigerator car to carry meat and fruit, the box car for ordinary freight, the tank car for oil, the hopper car for coal and ore. It would interest any boy or girl to make a study of the different kinds of vehicles used by the railroad and to point out how the growth of industries of different kinds has been made possible by the invention and use of special kinds of railway cars. The views here presented will help in making such a study.

A. Tracks

43 A busy path of commerce in central New York — four track railway, electric road at right, Erie Canal at extreme left.
61 Pittsburgh, Pa., a busy railroad center.
62 Railroad tracks by blast furnace, Pittsburgh.
79 Shipping anthracite coal, Ashley, Pa.
101 Harpers Ferry, West Virginia. Train of coal cars.
116 Railway tracks, Birmingham, Alabama.
128, 129 Busy track scene, ore docks, Conneaut, O.
163 Steam shovel at work, showing how track is laid.
170 The great Keokuk power dam and locks.
252, 253 Railroad tracks at Gatun locks, Panama Canal.
251 Tracks used in removing dirt from Culebra Cut.
256 Pacific entrance of the Panama Canal.
267 Tracks on wharves, Montreal, Canada.
277 Western terminus of Canadian Pacific R. R., Vancouver.
323 Railway station, Juncal, Chile.
325 At the nitrate mines, Chile.
327 Busy dock scene, Valparaiso, Chile.
420 Custom house scene and harbor, Goteborg, Sweden.
330 Cofa bridge on the Oroya railway, Peru.
440 To the clouds by rail, Mt. Pilatus, Switzerland.
499 Railway scene, Madras, India.
544 Boarding the train at Kansk, Siberia.
556 Harbor and station of Algiers, Algeria.
575 Cape to Cairo railway over Zambezi River, Africa.

B. Locomotives

82 Erecting shop, Baldwin locomotive works.
43 Four track railway in central New York.
101 Harpers Ferry, West Virginia. Freight engine.
163 Steam shovel at work, Mesabi Range, Minn.
330 Locomotive on the Oroya railway, Peru.
575 Cape to Cairo railway, Africa.

C. Bridges

50 Steel arch bridge across Niagara River.
61 Bridges across Allegheny and Monongahela Rivers.
101 Harpers Ferry, West Virginia.
154 "Soo" Canal, Michigan, showing bridge in distance.
174 The magnificent Eads bridge, St. Louis, Mo.
330 Cofa bridge on the Oroya railway, Peru.
366 The great Forth Bridge, Queensferry, Scotland.
470 The longest railway bridge in Europe.
575 Bridge on the Cape to Cairo railway.

D. Cars and Trains

43 A busy path of commerce in Central New York.
62 Coke and iron ore cars at blast furnace, Pittsburgh.
68 Loading coke into cars, Connellsville, Pa.
79 Shipping coal, Ashley, Pa.
101 Coal train, Harpers Ferry, West Virginia.
115 Mining phosphate and loading cars, Tennessee.
116 Birmingham, Ala. 50-ton hopper cars.
128 50-ton hopper steel cars.
129 Trainload of coal for Lake Superior consumption.
157 Loading 1400 tons of copper, Houghton, Mich.
163 Loading cars with iron ore, Minnesota.
250, 252, 253 Show dirt cars, Panama Canal.
251 Excavations in Gaillard Cut, Panama Canal.
256 Freight cars at Pacific entrance, Panama Canal.
267 Cars on the wharves, Montreal, Canada.
277 Canadian Pacific station, Vancouver, B. C.
323 Juncal station, Chile, S. A.
327 Freight car at dock, Valparaiso, Chile.
420 Cars at harbor to be loaded, Goteborg, Sweden.
440 To the clouds by rail — Mt. Pilatus, Switzerland.
499 Madras railway terminal and harbor, India.
544 Boarding the train at Kansk, Siberia.
556 Harbor and station of Algiers, Algeria.
575 Train crossing bridge over Zambezi River, Africa.

VII. URBAN TRANSPORTATION

A. Elevated, Subway and Surface Lines

In New York, London and a few other cities people travel on three levels — on elevated trains, on the surface of the street, and in subways; and at one point in New York, the railroads have a tunnel under the subway, and thus people travel on four different levels.

27 Street cars crossing the great Brooklyn Bridge.
31 Many forms of transportation required in large cities.
43 Interurban line at right of four track steam road.
139 Street cars on State Street, Chicago.
230 Market Street, San Francisco, Cal.
273 Metropolis of western Canada — Main Street, Winnipeg.
315 Street traffic, Buenos Aires, Argentina, S. A.
375 Patrick's Bridge, Dublin, Ireland.
380 Sackville Street, Dublin, Ireland.
473 Street cars pulled by horses, Constantinople.
587 Federal Parliament building, Melbourne, Australia.

B. Bridges

The tunnels and the bridges required for the use of people who live in cities illustrate in a striking way how the genius of man made possible the growth of great cities.

27 The great Brooklyn Bridge, New York.
50 Bridge across Niagara River.
61 Confluence of Allegheny and Monongahela Rivers.
101 Wagon and railway bridges, Harpers Ferry, West Virginia.
348 London Bridge over the Thames River, England.
375 Patrick's Bridge, Cork, Ireland.
392 The great bridge over the Rhine at Bonn, Germany.
397 River Meuse and Parc de la Citadel, Namur, Belgium.
400 Steamer docks, Rotterdam, showing lift bridge.
404 Queen Louise Bridge, Copenhagen, Denmark.
416 The Vassar Bridge, Stockholm, Sweden.
423 Flower market on St. Michael's Bridge, Paris, France.
442 The Kapellbrucke crossing the River Reuss, Switzerland.
451 Roman bridge over the Tiber River, Rome, Italy.
456 Florence and River Arno, Italy.
472 The famous Galata Bridge, Constantinople, Turkey.
500 The Howrah Bridge over the Hooghly River, Calcutta.
546 Bridge across the Pasig River, Manila, P. I.
560 The great Nile bridge, Cairo, Egypt.

VIII. AUTOMOBILES

The automobile is rapidly changing the conditions of life in the United States and many other countries. In hardly any large city of the world are the streets without automobiles. Even in Japan where the man-drawn carriage, the jinriksha, is still in use, one may find the automobile and the electric railway. When one realizes that the automobile has been in use only a short time, one must conclude that it will not be many decades before the engine will displace muscular power as the motor force of the world.

132 Building up automobile tire, Akron rubber plant.
150 Assembling room, chassis ready for engines, Detroit.
151 Experts testing engines, automobile plant, Detroit.
152 Employees leaving Ford automobile factory, Detroit.
316 Four o'clock parade of society, Palermo Park, Buenos Aires.
121 Automobile trucks necessary for quick delivery. 31 Automobiles in New York City; 8 Boston; 90 Washington; 122 Beaumont, Texas; 126 San Antonio; 139 Chicago; 167 Minneapolis; 230 San Francisco; 305 Rio de Janeiro; 308 Sao Paulo, Brazil; 315 Buenos Aires; 424 Paris.

IX. AIR CRAFT

The gasoline engine has taken transportation into the air and we are seeing the organization and development of air craft of various kinds. There can be no more interesting study than to trace the growth of the methods of transportation. Our ancestors carried their burdens on their backs or heads; their children used pack and draft animals; we employ waterways, railroads, electric railways, automobiles, and aeroplanes. Nor is the end yet. Our descendants will doubtless greatly improve upon our means of transportation.

394 Zeppelin flying over a German town.
426 Aeroplane on scout duty with French troops.

5. MARKETS AND MARKETING

COMMERCIAL GEOGRAPHY

By J. PAUL GOODE, Ph.D.

PROFESSOR OF GEOGRAPHY, UNIVERSITY OF CHICAGO

A market is primarily a place where merchandise is exposed for sale. To this place comes the merchant with his wares, and the buyers with their wants. The most primitive example is the peddler with his pack, offering his goods for sale. Usually the market is located at a fixed place, like the town square or the temple grounds, and often is limited to a fixed day. Such primitive markets, where the producer sells direct to the consumer, are in evidence all the world round, even in the largest cities, where fruit or garden truck, or fish or flowers are on sale.

With the development of modern transportation, such markets tend to disappear, but some very old markets, like that at Nizhni Novgorod, are flourishing at the present day.

An extension of the market idea has come into common use, where a locality or country is spoken of as a market for given supplies, for example when we say the corn belt is a market for labor-saving farm machinery, or China is a market for American cottons.

The following stereographs will serve to illustrate various phases of markets and marketing.

I. THE PRIMITIVE MARKET

In the primitive market the producer meets the buyer, as on the city square. The wares are laid out on the ground, to be inspected and haggled for by the purchaser.

572 The native market at Port Florence, Victoria Nyanza, Africa.

555 The market place at Tangier, Morocco.

387 Market place in the Cathedral square, Nuremberg, Germany. All over the world the market place has most frequently been in the

church or temple grounds, and when only occasional market times have been the rule, church days have been chosen.

429 The cathedral and market, Marseilles, France.

393 The market square, Cologne, Germany.

7 Quincy Market, for fruit and truck, Boston, Massachusetts.

447 Grindelwald on market-day, Switzerland.

109 Old slave market, St. Augustine, Florida, reminding us of the days, not so long ago, when men and women were the commodities to be bought and sold.

484 The great bell market at the Fair, Nizhni Novgorod. This is an annual market, where the caravan trade of all Asia brings its wares to Western buyers. It is something like a world fair, with grounds set aside for the purpose, and now with many permanent buildings.

339 Distributing milk, in the streets of La Guayra, Venezuela. A primitive market method of bringing the commodity to the buyer.

487 Milk maids delivering milk, Kiev, Russia.

396 Dogs and women bringing milk to market, Antwerp, Belgium.

341 The city baker, selling his wares, Caracas, Venezuela.

543 Charcoal peddlers, Korea. The charcoal may be carried from the mountain side many miles to the town, to be peddled to the consumer.

378 Irish boys peddling peat on the streets of Killarney, Ireland.

485 Market day, in the Jewish quarter of Warsaw, Poland.

466 Market place, Serajevo, Bosnia.

469 Market place in Rustchuk, Bulgaria.

473 Market place at Stamboul (Constantinople).

438 Cart loads of Malaga grapes going to market at Almeria, Spain.

395 In the vegetable market, Brussels, Belgium. An example of a specialized market.

423 Flower market on St. Michael's Bridge, Paris, France. A market in one special commodity.

481 A fish market on the quay in a Finland town. Fish is usually handled in a market devoted to sea food only.

II. GREAT MARKET CENTERS

Here extensive buying and selling are carried on, and goods accumulated for the supply of wide tributary regions. The heart of every large city is developed as a market center, with extensive store buildings devoted to the accumulation and sale of a great variety of products. As a rule, transportation advantages play an important part in the growth of such cities, and usually a harbor and a navigable waterway into the hinterland, are of prime importance. In considerable measure the population of such cities is made up of people who make their living in the manufacture, or purchase and sale, or transportation and warehousing of the goods handled in the market.

351 The Bank of England. For over a century the buildings seen here have been the financial market center of the world. The money market is the most specialized and most highly developed of all markets.

29 Wall Street, New York City. The central money market of the New World, and since the Great War began, the market center of the world's finance.

26 Waterfront of New York City. Most of the world's great cities are on navigable water, and good harbors have had much to do in making them great. The harbor of New York is crowded with ships from all the world. Congestion of business at this spot calls for the many great buildings.

30 Up Broadway from Bowling Green, New York. A canyon between lofty buildings, one of the greatest market streets in the world.

267 The wharves at Montreal, the leading market town of Canada.

48 Mouth of the Erie Canal at Buffalo, New York. The Great Lakes and Erie Canal make Buffalo a market center of large and growing importance.

61 Pittsburgh, where the Allegheny and Monongahela rivers unite to form the Ohio River. Good transportation and the presence of rich deposits of coal have made this place the steel market of the world.

139 State Street, Chicago. The largest retail shopping district in America. One store on this street occupies an entire block, is sixteen stories above the street and three stories below, and does a larger business than all the merchants in the largest city on earth could do a century ago.

167 Nicollet Avenue, Minneapolis. The business street in the market section of the city.

230 Market Street, San Francisco, the shopping center of the western metropolis.

327 Busy scene on the wharf of Valparaiso, the leading market town of Chile.

315 Government buildings as seen from the Bourse, Buenos Aires, the financial market center of the Argentine.

305 Rio Branco Avenue, in the business center of Rio de Janeiro, the chief market town of Brazil.

347 Landing stage at Liverpool. With a range of 31 feet of tide, a great floating dock is provided as a landing stage. Liverpool is the world's market center for cotton and for wheat.

381 Royal Avenue, the chief market street of Belfast, Ireland.

365 Princes Street, Edinburgh, Scotland. The principal market street of the Scotch capital.

348 London Bridge. The upstream end of the Thames harbor, the heart of the market section of the city.

420 The wharves of Goteborg, a lively market town of Sweden.

416 Vassa Bridge, in the heart of busy Stockholm.

386 Hamburg. The leading market city of Germany, head of ocean navigation on the Elbe.
400 The docks of Rotterdam, one of the world's great markets.
421 View of Paris from the Arch of Triumph. Paris is one of the world's great central markets, headquarters for fashion in the finest wearing apparel.
433 Harbor of Barcelona, the most active market center of Spain.
457 Grand Canal, Venice, one of Italy's most important market towns. For a thousand years Venice was the leading market of the entire Mediterranean.
462 Barge landing on Danube Canal, in the heart of Vienna, the great central market of Austria.
463 View on the Graben, a busy shopping district of Vienna.
464 Andrassy Street in the market center of Budapest, Hungary.
486 The Krestchatik, the principal market street of Kiev, Russia.
526 View in Tokyo, Japan, the largest city, and a great merchandising center of Japan.
513 Queen's Road, the leading business street of Hong Kong, the market center of South China.
514 Scene in the native quarter. Homes of the boatmen who handle the freight in the market of Hong Kong.
546 View in Pasig River, Manila. These boats, called "cascos," are the homes of boatmen who make their living handling the freight in the great market port of Manila.
511 The harbor of Colombo, Ceylon. A port of call for the south Asian trade, and a great trans-shipment market.
501 The temple grounds at Benares, India. Visited by many thousands of pilgrims, and an important local, native market.
492 View of Beirut, Syria, the most important market town of Asia Minor.
558 View over Alexandria, in the delta of the Nile, the leading market city of Egypt.

III. PRODUCTION CENTERS

For various reasons, certain localities have become centers where raw materials or manufactured commodities are handled in such large quantities as to establish a claim to importance as a world market. Some cities come to buy and sell certain commodities so extensively as to become the price making centers for the whole world. Thus London for many years has been the world market for wool, tea, ivory, diamonds, and money; Liverpool for wheat and cotton; New York for coffee and of late for money; Chicago for meats, and so on. The following stereographs will help to an understanding of the tremendous concentration of interests represented in great city markets.

140 Union Stock Yards, Chicago. The concentration of railways at Chicago has focused the "Corn Belt" and the Great Plains into

the largest live stock market on earth. The value of the packing house product is over a million dollars a day for every day in the year.

143 Trimming hams in preparation for the market. Chicago packing houses.

144 Making sausages. Meat thus prepared is sold at the ends of the earth. Chicago is the world market for provisions.

317 Cattle on range near La Plata, Argentina. So many cattle are raised on the farms and ranges of Argentina that Buenos Aires is becoming a very great market center for packing house products.

159 Dairy cattle and barns, Lake Mills, Wisconsin. The region west and north of Chicago has come to be the dairy center of the country.

45 Working 1000 pounds of freshly churned butter. Elgin, Illinois is the butter market of America.

57 Milking scene, New Jersey. The milk industry is extensively developed near all large cities in temperate lands. In our country the greatest development is near New York, and Chicago.

240 Pigeon farm at Los Angeles, the primary squab market of the whole country.

56 White Leghorn hens. Corning Egg Farm, New Jersey. There is so large a demand for eggs in our great cities, that special poultry farms are established to furnish the supply.

13 Drying codfish in the sun; Gloucester, Massachusetts, is the leading primary fish market of America.

226 Salmon: The finest haul of the season on the Columbia River. The salmon run up the glacier fed rivers to spawn. This makes the Puget Sound region the primary market for the world's salmon.

227 Butchering salmon. Astoria.

97 A mountain of oyster shells.

86 "Shucking" oysters. Chesapeake Bay is the largest oyster producing water on earth, and Baltimore is the primary oyster market.

531 Drying sardines on the beach, Beppu, Japan. Fully one-half the food of the people of Japan comes from the waters, and the shallow waters are the largest producers. So great fish markets are established in Yokahama, Beppu, Kobe and other such ports.

111 Sponge market, Key West Harbor. The shallow waters on the west shore of Florida are the largest sponge producers in our country, and Key West is the primary market.

521 Store of rich tea merchant, Chifu. For centuries China has been the leading tea producer in the world, and Chifu, Shantung, Amoy and Canton have developed as large tea markets.

302 Coffee pickers, Guadeloupe, W. I. Many tropical lands produce coffee, but the price is set in the largest buying market, which

has been in turn, London, Le Havre, Hamburg, and is now New York.

310 Drying coffee in the sun, State of Sao Paulo, Brazil. This region produces about three-fourths of the world's coffee, and Santos and Rio de Janeiro are the leading primary markets.

319 Vineyards near Mendoza. Soil and climate here favor the grape, and Spanish and Italian immigrants have brought their vines and skill with them, making Mendoza, in the Argentine Republic, a large grape and wine market.

236 Tokay grapes, at Acampo, California. The grape thrives so well all over California that the State furnishes the lion's share of fresh fruit, raisins and wine for the whole country.

390 Vineyards at Rudesheim, Germany. The river valleys of Europe from south Germany to the Mediterranean furnish soil and climate adapted to the grape, and local primary wine markets have developed over the grape region. Such markets are. Bordeaux, France, Oporto, Portugal, and Xerez, Spain.

149 Harvesting celery, Kalamazoo, Michigan. A cool climate and peat soils, such as a drained marsh or old lake bottom, invite the growth of celery. Kalamazoo is so favored as to become the leading primary celery market in America.

237 Navel orange groves, San Gabriel Valley, California. This most favored state leads the country in production of citrus fruits as well as grapes.

112 Tobacco field in Kentucky. Soil and climate conspire to make Kentucky the leading tobacco state, and Louisville the leading primary tobacco market.

42 Solar evaporation of brine for sale at Syracuse, New York — the leading primary salt market of the country.

153 Packing salt into barrels, St. Clair, Michigan. The salt deposits around Bay City, Michigan, have made that place the market second in importance for salt in America.

258 Cutting Sugar Cane, Porto Rico. Sugar of tropical origin has furnished the most of the American supply. For this reason the chief importing city, New York, has become our chief sugar market.

34 Conveyor with trays of loaf sugar. Because of being great shipping centers, Philadelphia and Brooklyn have become the largest refiners of sugar, and New York the chief sugar market of the New World.

35 Filling and sewing bags of granulated sugar.

294 Harvesting bananas, Costa Rica, Central America. The various lowlands adjacent to the Gulf of Mexico and the Western Caribbean Sea are so well adapted to banana culture that the American demands for this fruit has made New Orleans the leading banana market of the world.

289 Henequen, a century plant, whose leaves produce the hard fiber known as Sisal. This is the twine most used for binding grain, the world over. The world market for it is in Chicago, the

headquarters for the manufacture of reapers and other farm machinery.

552 Stripping the leaf stalks of Manila hemp (abaca, native name) from which the best rope making fiber is made. It is grown only in the Philippines, and Cebu is the chief world market.

553 Making rope from Manila hemp fiber at Manila. Manila hemp fiber is the best known material for cordage. The world's largest buying market has been London, but is likely to shift to U. S. A.

506 Spinning and weaving woolen shawls, at Srinagar, Kashmir, India. The pastoral people from northern India to the Hellespont have marvelous skill in the making of shawls and rugs. Important local markets have developed at many points.

40 Folding and ironing linen collars, Troy, New York. Troy is the chief linen collar market of America.

538 Feeding mulberry leaves to the silk worms, Japan. Nearly one-half of all the farmers in Japan rear silk worms, and Japan furnishes over one-third of all the world's export silk. Yokohama is the leading primary silk market.

541 Interior of a silk weaving mill, Japan. The cities of Kyoto and Osaka are important markets for manufactured silk.

22 Weighing and sorting skeins of raw silk. The U. S. A. is the largest buyer of raw silk in the world, and New York is the buying market.

54 Weaving room, Paterson, New Jersey. Most of the silk of America is manufactured in Paterson or other towns near the central market of New York.

239 Ostriches on the Cawston farm near Los Angeles, California. Southern California and Arizona have the hot and arid conditions to which the ostrich is adapted, and local markets for ostrich plumes are developing there.

21 Manufacturing jewelry, Providence, Rhode Island. Providence has become the great center for jewelry manufacture and sale in America.

117 Picking cotton. Nearly two-thirds of the world's cotton is produced in the humid lowlands of our southeastern states.

119 Cotton bales on the levee, New Orleans. Great primary cotton markets have developed in Charleston, Savannah, Mobile, Memphis, Galveston and New Orleans.

14 Cotton spinning mill at Lawrence, Massachusetts. One-half of all the American manufacture of cotton is in New England, and a number of market cities for cottons have grown up there, as at Lawrence, Fall River, and Boston.

272 Scraping the hair from hides, Canada. The leather industry has developed in places where hides are easily obtained, and where tanning material is plenty. So the oak and hemlock forests in Canada and the U. S. A. have developed the leather industry and centers like Boston and Philadelphia have become great leather markets.

11 Cutting leather for high quality shoes. Lynn and Brockton, Massachusetts, are shoe markets for a world trade.

41 Sewing room in a shoe factory, Syracuse, New York.

532 A Japanese shoe shop. Shoes or clogs in Japan are made of wood, and made by hand. So each town has its own market for shoes.

131 Crude rubber as it comes from the jungles, or plantations. Para is the chief primary market for wild rubber. Singapore and Colombo are rivals for the primary market for plantation rubber. London has been for many years the world's central market, but New York now takes first rank.

133 Making rubber boots and shoes at Akron, the manufacturing market of America.

17 Sorting wool, Lawrence, Massachusetts. The manufacture of wool has been so well developed in southeastern New England that Boston is the chief wool market in America.

81 The bobbin room in a Philadelphia mill. Philadelphia is next to Boston the greatest wool market, and is the leading carpet market of the country.

224 The Puget Sound and western Oregon regions have the best climatic conditions for forest growth, as shown by this great fir tree.

216 Port Blakeley Mills, near Seattle. Because of the rich forests great mills are developed, and the Puget Sound region comes to be the greatest lumber market in the world.

217 Shipping lumber, Washington, U. S. A. Much of the lumber for foreign trade goes from this market by sailing vessels.

215 Log rafts. Much of the lumber for the coast trade is towed in great rafts.

509 "Elephants a haulin' teak, in the slushy squdgy creek." Burma is the world's chief market supplying teak, and the elephant is the best lumber jack.

412 Grinding billets of wood into pulp for paper. The most of the world's paper now is made from wood pulp, hence the primary paper markets are in the forest lands, Norway, Canada, and the northern states of America.

19 Cut rags, for paper. The best paper is made from linen rags, and Holyoke, Massachusetts, is the chief manufacturing market.

20 Inspecting paper, Holyoke, Massachusetts.

297 Cutting tobacco. The best tobacco in the world is produced in western Cuba, and Havana is the market for it.

325 Sacking nitrate, Chile. The world's primary nitrate market.

573 Shipping ivory, Mombasa, Africa. The world's supply of ivory comes largely from central East Africa, and Mombasa is the primary market. The world market is at London.

58 Firing table ware, Trenton, New Jersey, and East Liverpool, Ohio, are the leading pottery markets of the new world.

59 Decorating porcelain ware, Trenton, New Jersey.

79 Coal breaker in the anthracite region, eastern Pennsylvania. The

anthracite fields cover but 480 square miles, but furnish almost one-quarter of all American coal.

129 Shipping coal, at Conneaut, Ohio. The region of eastern Ohio and western Pennsylvania and West Virginia furnishes about one-half of all the American coal. Pittsburgh is the chief bituminous coal center. Much coal is shipped westward from the Great Lakes ports.

128 Unloading iron ore from a Lake Superior boat at Conneaut, Ohio. Most of the iron ore in America comes from the Lake Superior basis, and travels by boat to meet the coal and coke of the northern Appalachian fields. This provides for an important series of markets in iron and steel from Detroit round the south shore of Lake Erie to Buffalo.

62 A blast furnace at Pittsburgh, Pennsylvania. Because of the rich deposits of coking coal in the vicinity, and the supply of iron ore from Lake Superior, Pittsburgh has become the greatest iron market in the world.

65 Filling molds with steel, Pittsburgh. For reasons above given Pittsburgh is the greatest steel market on earth.

82 General view of the erecting shop of the Baldwin locomotive works, Philadelphia. Because of the splendid development of the Baldwin Company, Philadelphia sells more locomotives than any other city in the New World.

150 Assembling Room in a Detroit automobile factory. Detroit is the world's leading automobile market.

IV. REGIONS WITH A LARGE DEMAND

Certain regions are spoken of as *markets* for a given article. Thus America is spoken of as a good market for diamonds; the great prairie plains as a market for farming machinery; the populous orient as a great market for cotton cloths, and so on. There is endless opportunity for illustration here, and only a few of the many possible illustrations are suggested below.

203 Stamp mill and gold concentrator, Ouray, Colorado. We think of the mining regions as great markets for rock drilling, crushing and milling machinery.

334 Silver smelter, Cerro de Pasco, Peru. The countries along the Andes Mountains are all good markets for mining machinery.

252 Gatun Locks, Panama Canal. While the great locks were building, the Panama Canal was a good market for Portland cement, and for excavating machinery.

407 The Lotefos, famous Norwegian waterfall. Because of her many waterfalls, Norway is a fine market for hydraulic and electrical machinery.

178 Plowing with a tractor, South Dakota. The great plains, smooth and fertile, invite the use of labor-saving farming machinery.

...easing wheat, Red River Valley. All our wl
good markets for harvesting and threshing mach
North Dakota, is a great market for farm machin

4 Ancient method of threshing in Mexico, a promisi
American machinery.

9 Treading out the grain, Greece — A market op
American machinery.

7 The threshing floor, Nazareth, Palestine. Anothe
portunity for American machinery.

2 Threshing beans, Egypt — a potential market for A
chinery.

8 Native women grinding wheat, Palestine — a mark
devices.

1 Washing clothes, Nice, France. A possible market
washing machines.

9 A Chinese crowd looking at the camera. It suggest
market for American cotton cloths.

3 Mohammedan crowd before the Jumma Mosque, Delh
great market for cotton clothing.

3 Chinese sawing lumber with pit saws. A market
modern saw mill machinery.

1 Cofa Bridge on the Oroyo Railway, Peru. The need
in South America makes a great market for America
locomotives and rolling stock.

Conveying salt by wheelbarrow, China. There is a gr
ing in China and a demand for railways — a great
American manufactures.

A stone road roller pulled by human muscle, Nank
a market for modern steam rollers.

Great buildings seen from City Hall

6. NATURAL FORMS AND FORCES

PHYSICAL GEOGRAPHY

By WALLACE W. ATWOOD

PROFESSOR OF PHYSIOGRAPHY, HARVARD UNIVERSITY

The use of the stereograph is nearly as good as direct personal observation in the field. In many cases the views secured by the photographer are better than one might happen upon while in the same region. The views here listed have been taken with great care, and selected as the best of many thousands.

The teacher of geography always aims to give the general physical features of the region that is being studied, and a systematic use of these views will help greatly in giving definite and accurate images. The classification following is in accordance with the best text-books, and should prove convenient to the teacher.

In studying an individual view the student should have in mind several questions, namely:

(1) What does this view best illustrate?
(2) Are the land forms of solid rock or loose material?
(3) What may be the origin of the loose material?
(4) What special land forms are shown here?
(5) How may these be best described?
(6) What places have I myself ever seen that are like this one?
(7) How have the physical features affected the settlement and the activities of the people in this region?
(8) Is there anything in the view that I do not understand and must ask the teacher?

A full course for children in the study of geography might easily be framed about this series of 600 views. The lesson growing out of a single picture may often lead to a real and vital interest in a foreign land and a foreign people. When once accustomed to using these views the teacher will find that they facilitate the giving of a strong and effective lesson.

They raise problems in the child's mind, and call for original thought, thus vitalizing the work.

I. FORCES WHICH CHANGE THE SURFACE OF THE EARTH — WEATHERING — EROSION

During past ages the surface of the earth has been changed by various natural forces, including the atmosphere, ground water, surface water, freezing and thawing, snow and ice in the form of glaciers, and internal forces such as heat and pressure, and organic agencies including man. These forces have produced the various natural features of the earth's surface which include mountains, hills, volcanoes, lakes, rivers with their shores and banks, oceans and islands, capes and peninsulas.

A. ATMOSPHERE

1. Wind

The action of wind is brought about because of the dust and sand which it carries.

166 The wind will raise the dust.
178, 179 A source of dust.
68 Coke ovens produce dust.
300 Dust coming out in clouds.
563, 565, 209, 211 When the wind blows the sand flies.
223 The wind will pile up sand as it does snow.
477 Old Grecian city buried by action of wind.
565, 567 These faces have been worn by wind driven sand.

2. Chemical Elements

These include oxygen, carbon dioxide and water.

27, 379 The cables which suspend the bridge are painted to prevent rust.
43 The steel rails will rust away.
253 These steel boats are always painted to prevent rust.
9, 10 Houses and fences painted to prevent weathering.
37 The shingles treated with creosote to prevent decay.
113 The weather has cracked the old logs.
10 Weathering will gradually dim these words.
36 The lettering on these tombstones is nearly worn away by wind and rain.

3. Temperature

The freezing of water in the crevices of rocks breaks them in pieces.

330 The mountain is being broken to pieces.
51 Frost and rain are breaking off the rocks.
200 The pillars become roughened by wind and rain.
201 The soft materials have been loosened and washed away.
207 The hard parts are the least affected by weather.

4. Fantastic Features Due to Weathering

197 The huge piles of rocks stand like sentinels.
200 A gateway to the fields beyond.
201 Spires reaching towards the heavens.
205 Nature has furnished a roof for a whole village.

5. Talus

207, 208, 323 Show talus piles or cones as result of weathering.

6. Sand Dunes

223 Sand dunes, the work of winds.

B. UNDERGROUND WATER

This is the water which has run down into the soil and is not seen on the surface.

1. Sources

These are rain and snow.

1, 162, 542 The melting snow will sink into the ground.

2. Conditions for Producing Underground Water

104, 105 Water flows slowly here and sinks in quickly.
83, 178, 179, 419 Water will readily enter these soils.
38, 70, 224 Forests aid in forming ground water by holding rain until it can soak into the ground.
72, 173 Sod holds rain until it soaks into the soil.

3. Disposal of Ground Water

1, 169, 173, 195 Small streams get considerable of their flow from *springs.*
192, 193 *Hot springs* — this water is too hot for animals or plants to live in.
194 *Geysers* — every hour a million and a half gallons shoot up.
161 Getting rid of too much ground water.

4. The Work of Ground Water

193 The heated water brings minerals from the depths.
192 Deposits left in form of basins.
206 A petrified tree which lived ages ago. Underground water gradually took away the wood and left in its place particles of quartz.
38 Underground water dampens the roots of plants and makes them grow.

C. RUNNING OR SURFACE WATER

1. Source

Running water comes from rain, snow, ground water, ponds, lakes and glaciers.

191 The stream in the valley is being fed by the snow,

542 Melting snow often forms streams.
195 Snow melting to form the ponds and streams — the beginnings of rivers.
154 Water from Lake Superior.
264, 265 Water from the Great Lakes.
322 The beginning of a river in this glacial lake.
276 The stream begins where the glacier ends.
408 The source of the stream is the distant glacier.
448 Streams begin in these valleys.

2. The Work of Running Water

Erosion

576 Some rocks are broken sooner than others.
244 The loose soil is making a gradual slope.
341 A recent rain has hollowed the street.
49, 50 The rushing water wears off the edge of the hard rock.
318 Continual pounding of the water breaks the rocks.
407 Plunging down a mountain, water deepens its path.
197 Nearly one-third of a mile deep has the water worn this gorge.
363 The tiny brook wears a deep path.
206 Formerly covered with soil.
207, 208 Broad and deep the channel has been made.

Depositing

509 The slow stream deposits its load.
467 A winding river will fill in its curves.
408 Fertile soil washed down from the mountains.
120 At their mouths rivers may deposit their soil in the form of deltas.

D. SNOW AND ICE

1. Valley Glaciers

276, 279 A bank of snow begins a glacier.
448, 427 Snow the year around is needed for glacial formation.
275 Layers of snow changing to ice.
446 Natural home of the valley glacier.
428 The great sea of ice — crevices by the hundred.
408 The distant valley filled with a glacier.
219, 274 These crevices are often 100 ft. or more deep and are due to an unequal surface over which a glacier moves or to different rates of movements.
361 The valley has smooth curves as the result of glacial action.
274, 428 These stones and soil were torn from the mountains.
276, 408 Glaciers in melting produce streams.
361, 369, 377, 459 Glacial lakes surrounded by hills.

2. Ice Fields and Continental Glaciers

A. Conditions of Formation

345, 346 Fields of ice about the poles.
344 A real field of snow and ice.
342, 343 Near where the ice fields begin.

B. The Work of Ice Fields

38, 379 No sharp ridges in this glaciated area.
361 A hollow where a glacial lake was formed.
47 Soils for gardens have been left by glaciers.
137, 147 The fertile fields of Indiana and Illinois were made largely of glacial drift.
159 Wisconsin's famous herds feed where the glacier once existed.
161 Some glacial lands need to be drained.
361, 369, 377 Glacial lakes often have sloping shores.
73 Small hills showing glacial action.
262 The rolling landscape formerly covered with a continental glacier.

C. The Effects of Glaciation on Human Affairs

137, 147 Fields of grain on soil of glacial origin.
159 Dairying on glacial lands.
47 Glacial soils are productive.
357 Rolling fields of grain in glaciated region.
48 154 The Great Lakes, of glacial origin, are important waterways.

E. HEAT AND PRESSURE

1. Sinking of the Earth's Crust

Internal heat and pressure helps to change the earth's surface.
256 The distant islands were once hills.
39 The sinking of the land drowned this valley.

2. Raising of the Earth's Crust

A. Mountains

102, 322, 323, 408, 460, 508 Mountains are usually formed by elevation of the land.
330 Irregularity in strata is due to internal forces.

B. Volcanic Action

222, 291, 300, 525, 548 Volcanic action sometimes forms mountains.

3. Earthquakes

231 An earthquake has cracked the soil.
526 Houses are low so as to withstand the earthquakes.

F. ORGANIC AGENCIES

284 Vegetation is tearing down the mound of stone.

111 The land here is built of skeletons of corals.
3, 4 Man is changing the face of nature.
74, 250, 251 Man digs great valleys.
163 The big steam shovels make big holes.

II. NATURAL FEATURES OF THE EARTH'S SURFACE

A. RIVERS AND VALLEYS

1. Young Rivers

Young rivers flow rapidly, have steep banks, and cut deep channels.

195 The very beginnings of two rivers.
228 The river has hardly found its path.
363 The small stream wears a deep path.
49, 50 The water flows rapidly by.
407 Young rivers and young mountains are often companions.
207, 208 Digging for ages but still young.

2. Mature Rivers

These are rivers with a moderate current, sloping banks, and usually a straight course.

39 The stream flows slowly.
580 Such rivers are often shallow.
392 Here the Rhine is broad and calm.
391 Mature rivers are often great waterways for commerce.
170, 174 Across the smooth Mississippi.
101 Where two rivers peacefully meet.

3. Old Rivers

Old rivers flow slowly, often in winding courses.

509 Low banks are characteristic of old rivers.
106 Boats are usually common on such streams.
517 The broad slow-moving stream of China.
470 A famous bridge over the wide Danube.
467 The river in its winding course.

4. Drowned Rivers

These are rivers in which the bed has sunken so that the water is deep, often forming estuaries at the mouth.

39, 51 Deep enough for the largest ships.
100 Battleships find plenty of room here.
264 The largest ocean liners travel in this river.

B. LAKES

A lake is an inland body of water.

1. Some Lakes of Glacial Origin

361 England; 369 Scotland; 377 Ireland; 459 Italy; 48, 154 the Great Lakes of America.

2. Lakes of Non-glacial Origin

222 The top of the mountain sunken, the peak an island.
212 A city built on an ancient lake floor.

3. Effects of Lakes on Human Affairs

48 Grain from the west in these boats.
128, 129 Coal and iron are shipped by boat on the lakes.
154 Ship loads of produce from the west.
157 Copper is carried on the Great Lakes.

C. COAST FORMS

1. Beaches

A beach may sometimes be defined as the sand or gravel along the sea-shore between high and low tide.

60 Bathing along the beach is very popular.
430, 439 Sandy beaches are good landing places for small boats.
432 Beaches may be rocky or sandy.
13, 531 The beach is a good place to dry fish.

2. Coastal Lowlands

401 Nearly as level as the sea and not much higher.
248 A low plain below the hill.
531 A flat country with mountains in the distance.

3. Drowned Coasts

The land along the coast sometimes sinks.

382 The small islands growing smaller yearly.
374 The sinking of the land often makes harbors.
307 The distant harbor was once a valley.
299, 277 Deep water is characteristic of such harbors.

4. Sea Cliffs

Some seashores are very rocky.

439 A steep sided rock standing in the water.
432 A sudden drop from the castle to the sea.

5. Capes

A cape is a portion of land projecting into the sea.

414 The mountain projects to form the cape. Such a high mountainous cape is called a *promontory*.
248 Reaching out toward the ocean.

6. Peninsulas

A peninsula is a body of land almost surrounded by water.

432 The Castle of Monaco is built on a small peninsula.
256 The wireless tower is on the peninsula.
248 The lower part of the city is built on a peninsula.

7. Isthmus

An isthmus is a narrow strip of land connecting two larger portions of land.

432 Only room for a narrow road on the isthmus to the castle on the peninsula.

8. Harbors

Harbors are indentations in the coast, often at the mouth of rivers, in which boats may anchor.

591 The city is built near the harbor.
556 Railroads and steamships meet at the harbors.
511, 52 Ocean liners and harbor boats.
25, 26, 27 One of the busiest harbors in the world.
374 A big harbor well protected from gales.
313 Harbors are made deeper by dredging.
499, 574 Poor harbors.
492 An old commercial city on the Mediterranean.
489 Several cities along the banks.
278 A fisherman's harbor near the greatest of fishing places.
307 One of the best harbors in the world.
430, 217, 257, 277, 280, 299, 304, 314 Other harbors.

9. Bays

A bay is a body of water partly surrounded by land.

248 This breakwater is built out into the bay to form a harbor.
492 The bay at Beyrout.
527 Mississippi Bay, Japan.

10. Straits

A strait is a narrow portion of water connecting two bodies of water.

489 The waterway connecting the Black and Mediterranean Seas.
439 Entrance to the Mediterranean.

D. ISLANDS

An island is a portion of land, smaller than a continent, entirely surrounded by water.

1. Flat Islands

25 The islands in New York harbor are not much higher than the water.
99 Barely out of the sea.
401 An island of Holland.

2. Rocky Islands

369 Ellen's Island in Loch Katrine.
256 At the entrance to the Panama Canal.
382 Small rocky islands near Ireland.

E. PLAINS

1. Coastal Plains

These are plains near the sea coast made by uplifting the ocean bed.

108 This was formerly the bed of the ocean.
122 Oil is frequently found near the sea.
105 Along the coast are miles of plains.
104 Level fields with water are needed for rice culture.
289 Coastal plains are often of sandy soil.
399 Land so low that the sea is held by a wall.

2. River Flood Plains

Some of the most fertile fields are found in the broad valleys of rivers.

136, 233 River flood plains of the U. S.
317, 321, 332, 333 River flood plains of South America.
408, 419, 467 River flood plains of Europe.
509, 515, 518, 529, 549 River flood plains of Asia.
561, 564, 580 River flood plains of Africa.

3. Compound Alluvial Plains

Several rivers help to make this type of plain.

237 Fertile lands are in the valleys.
467 Two rivers uniting form large plains.

4. Delta Plains

These have been formed by continued deposit of alluvial soil at the mouth of rivers.

120 This land has been gradually deposited by the Mississippi.
500 The Ganges carries and deposits acres of soil.
558 A city built on a delta plain.

5. Lake Plains

Bottoms of former lakes form alluvial plains.

47 Fertile soil of a lake plain.
166 An old lake bottom growing potatoes.
149 A very fertile soil is required for celery.
139 A great city built on a reclaimed lake bed.

6. Great Western Plains of U. S.

Formerly covered by a great inland sea.

181, 183 The Nebraska and Kansas plains are noted for alfalfa.
186 Cattle grazing on the semi-arid plains of the west.
198 Sugar beet growing requires fertile level land.
199 These great plains are often very dry in summer. Good culture makes them productive.
126 A level part of Texas.
121 A level town in Oklahoma.

7. Glacial Plains

These are plains formed by ice fields or glaciers.

136, 137 The great corn fields of Indiana are glacial plains.
161 So level that water does not run off readily.
488 Agriculture on the glacial plains of Russia.
147 Illinois field of oats on the glacial plains.

8. Plateaus

A plateau is a tract of high level land.

218 Some elevated plains produce good crops.
190 Some elevated plains are good for grazing only.
209 Some elevated plains are deserts.

9. Effects of Plains upon Human Affairs

85 Picking peaches on a coastal plain.
105 Rice is grown where the land is flat and wet.
127 Grazing on the semi-arid plains.
136, 137, 147 Productive fields on fertile plains.
140 From the rich plains of the west.
166 Potatoes require fertile soil.

F. MOUNTAINS

1. Young Mountains

These are characterized by having rough pointed peaks and are believed to be of recent origin, geologically considered.

213 These mountains are being rapidly leveled.
447, 448 A young mountain with a sharp peak.
445 Snow will not stay on the steep slopes.
441 These mountain paths are difficult to climb.
440 A dangerous road to travel.
276 Sharp ridges characterize the young mountains.
427 Time will smooth the roughened peaks.
323 The slopes are becoming less steep.
322 The valley is filling with the broken peaks.
508 Mountains above the clouds.

2. Old Mountains

These are characterized by having rounded peaks worn off through ages of time.

102 Mountains rounded like the waves of the sea.
361 The mountains have been rounded by glaciers and washed into the valleys.
38 At one time mountains, now a rolling landscape.
39 The round top hills sloping to the river.

3. Mountain Ranges

102 This view of the tops of the Blue Ridge shows very clearly the idea of a mountain range.
213 The Wasatch Range rises behind Ogden.
243 The Coast Range in Alaska was a great barrier to gold seekers.

4. Mountain System

All the ranges and highlands that belong to one highland form a system. It is impossible to show a whole system in one picture.

508 This picture of a little part of the Himalayas may help you to imagine ranges behind ranges, peaks behind peaks extending for hundreds of miles. That would give you some idea of a mountain system.

5. Mountain Peaks

221 Mount Hood, Oregon, in the Cascade Range.
276 Mount Sir Donald, the Matterhorn of the Selkirk Mountains in Canada.
445, 447 Peaks in the Alps Mountains.
448 The Matterhorn, Switzerland.
508 Peaks of the Himalaya Mountains.

6. Volcanic Mountains

A volcano is an opening in the earth through which lava and gases are expelled.

300 When the heated matter forces its way out there are tremendous explosions. Rocks are blown to dust and thrown miles into the air. Great quantities of steam and of broken rock are thrown out. The lava or melted rock flows down the side.
453 Vesuvius. A volcano builds up a cone about the opening.
221 Mount Hood has been quiet for so long that the cone has become weathered. It is cut by many valleys.
288 Popocatapetl, an active volcano in Mexico.
291 The twin volcanoes of Guatemala.
548 Mayon has had many destructive eruptions.
525 Fuji-Yama, the sacred mountain of Japan.

7. Divides and Passes

195 Water from one pond flows into the Atlantic, from the other into the Pacific.

1 Dairying in the mountains.
3 Reindeers are found in the mountainous north lar
0, 441, 48 The traveler frequents the mountains.
7, 187, 214, 243 Mountains are very often rich in mine
8 Small farms in mountains.
1 Mountaineers often follow dairying.
0, 441, 48 Travelers delight to climb mountains.
3 Mountains act as barriers, making communication
5 The Andes make the west coast of South America
nitrate remains. Rain would carry it away.
0 to 459 The Alps shut out the cold winds and make It
9 to 508 The Himalayas cause the rains to fall in
that land wonderfully warm and fertile.
0 to 449 Mountain people, such as the Swiss, are
loving people.
6 They are often backward in their civilization.

See also classification on Zones.

9. Mountains of the World

2, 219, 221, 243, 274, 276 Mountains of N. America.
2, 323, 326, 330 Mountains of S. America.
3, 408, 409, 427, 428, 436, 440, 441, 445, 446, 447, 4
Mountains of Europe.
5, 525, 531, 548 Mountains of Asia.

For Zones and Deserts, see classification on Zones.

10. Hills

480 Mountains worn down to hills

7. ZONES AND THEIR EFFECTS

ELEVATION OF LAND (ALTITUDE) AND ITS EFFECT ON LIFE

By ROBERT De C. WARD, A.M.

PROFESSOR OF CLIMATOLOGY, HARVARD UNIVERSITY

Climate itself cannot be illustrated by means of photographs. The effects of climate, however, upon the general appearance of a country; upon vegetation, crops, occupations, dwellings, etc., may perfectly well be shown in this way. A picture of the general climatic conditions is thus obtainable. In the following list, those photographs have been selected which furnish the more obvious illustrations of such climatic controls over the earth's surface and its flora, and over man's mode of life under the limitations which climate imposes. This broad view of climate in relation to man needs emphasis in any study of geography.. The basis of the classification is that generally adopted by climatologists in their description of the climatic zones, and of their subdivisions. The classification is therefore based on climate, and the views are not subdivided on the basis of political divisions. Views of cities are not included unless they have some more or less distinct climatic interest. For such general views, reference should be made to the Geographical Classification.

It must be borne in mind that there is usually a gradual transition from one climate into another, and for this reason many views might equally well be listed under two headings. Furthermore, the zones of climate are not separated by any rigid boundaries.

I. THE CLIMATIC ZONES: THEIR CHARACTERISTICS AND THEIR PRODUCTS

A. "THE TROPICS"

1. The Equatorial Belt

The dominant characteristic of the equatorial belt, (i.e., the inner portion of the tropical zone within about 10° or 12° of the equator) is the prevailingly high and uniform temperature throughout the year, with no seasons in our sense, and a generally heavy rainfall, coming normally in two rainy and two so-called dry seasons. In some districts, however, rain falls throughout the year, and the "dry" seasons are only slightly less rainy than the "wet" seasons. These double rainy and dry seasons are easily modified by other conditions, as by the topography, altitude, and, as in the Indo-Australian area, by the monsoons. There is thus no rigid belt of equatorial rains extending around the world. The high temperatures and heavy rainfall produce a superabundance of vegetation, unfavorable to human occupation. The population is generally sparse, and at a relatively low stage of civilization. The life of man as a whole is controlled by the rains. The difficulty of travel and transportation, and of clearing the forests, operate to retard the advance of civilized man. The hot damp climate is generally unfavorable for settlement by people from cooler altitudes. The foreign whites are few in number, but are the driving power in the development of these equatorial lands.

572 Natives of equatorial Africa, in typical costume.
247 Rubber tree, showing scars from cutting, Panama.
131 Crude rubber, one of the most valuable products of the rainy equatorial forests, especially in Brazil.
570 Peeling bark for bark cloth, equatorial Africa.
573 Ivory from the African forests, Mombasa.
294 Bananas, one of the most widespread and valuable food plants of the tropics, Costa Rica.
293 Mangoes, an important food of tropical peoples, especially in the East Indies.
571 Sisal hemp, valuable fibre plant from equatorial Africa.
255 Maintaining health in the tropics, Panama hospitals.
249 Village scene, Colon, Isthmus of Panama.
337 Narrow streets in a tropical city, providing shade during much of the day, Baranquilla, Colombia.
338 Where heating plants are not necessary, La Guaira, Venezuela.
251 What the intelligence and energy of the northerner have accomplished, Gaillard cut, Panama Canal.
252 Completed Panama Canal, cut through tropical jungles.
254 What the Panama Canal has made possible.

2. The Trade Wind Belts

About one-half of the earth's surface is within the trade wind zone for part or all of the year. These belts, therefore, include a considerable variety of climates. The seasonal range of temperature is relatively small, but is greater than in the equatorial belt. The control over man's life and activities is to be found in the rainfall. The windward (eastern) sides of continents or islands in the trade winds are well watered, especially if the land is high, while the interiors and leeward (western) slopes are dry. Where the trades blow directly on shore the year around the rainfall is usually fairly well distributed through all months but is heaviest in winter. During the summer, over much of the trade wind zone, the migration of the belt of equatorial rains into higher latitudes brings a tropical rainy season, whose duration and intensity vary with the distance from the equator, and with other controls. Where the trade winds blow over continental interiors, far from the ocean and also beyond the reach of the migrating belt of equatorial rains, pure deserts are found. These deserts may even reach the sea on the leeward side of a continent, as in western Australia and northwestern and southwestern Africa. When high mountains border the western coast, as in Peru, the trades are rainy on the eastern side of the ranges, and a desert prevails on the leeside. Vegetation in the trade wind zone varies closely with the rainfall. The transition from wet tropical forests, through savannas, to the desert marks the transition from abundant, through moderate, to deficient rainfall. By reason of their altitude, tropical plateaus in the trade wind zone have a more temperate climate than the lowlands. Their vegetation and their crops clearly indicate this. Man finds in the trade wind belt more favorable conditions for work and development than in the perennially hot muggy belt of equatorial rains.

(a) *Windward continental lands and tropical islands with generally abundant rainfall*

307 The picturesque environs of a city in the southern tropic, Rio de Janeiro, Brazil.
304 A tropical port, Bahia, Brazil.
257 Harbor scene on an island in the northeast trade winds, San Juan, Porto Rico.
258 Sugar cane, an important crop in moist, warm tropical and semi-tropical lowlands, Porto Rico.
298 A Cuban farm.
302 Picking coffee in the West Indies, a trade wind zone product.
295 One of Porto Rico's most important crops, coffee, being unloaded at Havana, Cuba.
297 Cuban tobacco, growing under the shade of banana trees for protection against the sun.
303 Cocoa, a characteristic product of the damp lowlands of tropical America, West Africa and the East Indies.
301 Cattle on the rich grass lands of Jamaica.

300 A west Indian landscape: Martinique.
259 Papaya trees growing in the mild tropical climate of the Hawaiian Islands.
592 Natives of the Fiji Islands, in the southeast trade belt.
291 Scene in Guatemala, Central America.

(b) *Leeward continental lands, with climate often tempered by altitude, and summer rainfall ranging from deficient or light to abundant*

287 Characteristic vegetation of the semi-arid Mexican plateau.
282 The bare hills around the city of Mexico.
288 Irrigated and cultivated fields on the Mexican plateau.
285 Drawing sap from a Mexican agave, "century plant," to be made into the national drink, pulque.
284 Threshing on the Mexican plateau, where many temperate zone cereals can be raised.
281 Adobe hut a cheap and serviceable building in a land of relatively little rainfall.
289 Henequen, a species of agave, yielding sisal fibre from which bagging and cordage are made, Yucatan.
575 The open country of southeastern Africa. Cape to Cairo Railway, near Victoria Falls.
580 Fording the shallow Vaal River, in a district of light rainfalls, South Africa.
576 The rushing waters of the Zambezi River, fed by the heavy equatorial rains, Rhodesia, Africa.
310 Sun-drying coffee during the winter dry season on the Brazilian plateau, State of Sao Paulo, Brazil.
311 Carrying Brazilian coffee to the railroad.
589 Cattle on the grass lands of southern Australia.

(c) *Leeward deserts, shut off from rain-bearing winds by mountains to windward*

330 The bare mountain slopes of Peru.
333 Planting sugar cane on the irrigated coast desert of Peru.
332 Preparing soil for planting sugar cane, Peru.
329 Snow-capped mountain rising above desert plateau, Peru.
335 On the dry Bolivian plateau.
325 Nitrate mines in desert region, Chile.

3. Monsoon Regions

The continental lands and islands in the monsoon belt are characterized by marked seasonal changes in wind direction. The rainy season comes when the winds blow onshore; the dry season when they blow offshore. The rainfall is generally abundant, often excessive, and as a rule follows the vertical sun; i.e., the summers are rainy while the winters are dry. Over most of the greatest and most typical monsoon area, that of India, eastern Asia and the adjacent Islands, the summer (rainy) monsoon is prevailingly southwesterly or southerly.

The northeast trades blow in winter, and are known as the dry monsoon. Some places on eastern coasts or slopes have their rainy season in winter, with the northeast monsoon. There is often no sharp division between trade controls and monsoon controls.

547 The shady side of the street preferred, Manila, P. I.
546 House boats, well protected against the hot tropical sun and the heavy tropical rains, Manila, P. I.
549 Rice fields on an island in the monsoon belt, Manila, P. I.
550 Hulling rice, the most important cereal grain of hot and rainy tropical districts, Island of Luzon, P. I.
551 Coconuts, a characteristic tropical lowland product.
552 The raw material for hemp, one of the leading Philippine exports.
553 Making hemp rope, Philippine Islands.
554 Tropical forests, Island of Guam.
574 East African seaport, in hot, damp coast climate.
508 Where the mountains reach above the snow line, Himalayas.

B. THE SUB-TROPICAL BELTS

These are marginal belts, between trades and westerlies, and share in some of the characteristics of both types of climate. They are far enough from the equator to be free from continued high temperatures, and near enough to be spared extreme cold. Their rainfall is controlled by the stormy westerlies and, in some districts, by the inflowing damp continental winds of summer. The former control gives winter rains; the latter brings a summer maximum. Where both controls are at work, there is rainfall throughout the year. Except in the latter case, the rainfall is usually rather light. In districts beyond the reach of effective winter rains, as in Egypt, for example, there are deserts. The sub-tropical belt may be subdivided according to the controls and seasons of rainfall.

1. Districts with "Mediterranean" Climates

These districts have mild winters, warm and dry summers, and winter rains from the cyclonic storms of the prevailing westerlies, which give generally sufficient but not abundant rainfall. Because of their small ranges of temperature, their abundant sunshine, and their general freedom from severe storms, these districts have long been well-known and popular health and pleasure resorts. This type of climate is mainly limited to the western coasts of the continents, and to the islands off these coasts, in latitudes 28°–40°. The area over which these conditions prevail is exceptionally wide in the Eastern Hemisphere, and reaches far inland there. The fact that the Mediterranean countries are so generally included in this belt has led to the use of the name "Mediterranean climates." Irrigation is generally necessary in summer. Olives, grapes, oranges are characteristic plants.

430 A favorite resort on the Mediterranean Riviera, Cannes, France.
432 Monaco, on the Mediterranean Riviera.

459 Lake Como, a well-known health and pleasure resort.
495 Jerusalem, and its olive trees, typical of Mediterranean climates.
497 Threshing in the dry season, Palestine.
496 The bare hills and bright sunshine of Palestine.
493 Streets of Damascus, roofed over as a protection against sun and rain.
489 General view of the Bosporus, showing characteristic vegetation.
475 Athens, Greece, with cactus and scrubby vegetation in foreground.
479 Threshing during the dry summer in Greece.
480 Sheep grazing on the lowlands of Greece.
436 The irrigated slopes of Granada, Spain.
437 Oranges from irrigated lands, Valencia, Spain.
434 The open tableland of Spain, Semi-arid and treeless.
438 Bringing the famous Malaga grapes to market.
236 Vineyard in the "Mediterranean" climate of California.
237 Southern California orange groves, on irrigated lowlands.
238 Orange blossoms and fruit, southern California.
234 An almond orchard, California.
233 Harvesting in the dry summer of California.
239 California ostrich farm, a reminder that the climates of south Africa and of California are similar.
326 Valparaiso, Chile, whose climate is much like that of the central California coast.
319 Italian grape-growers, Mendoza, Argentina.
321 Scene on the Mendoza River, Argentina, a district of semi-aridity.

2. Semi-arid and Arid Districts

These are subtropical lands which are too far from the westerlies to receive more than scanty precipitation from the cyclonic storms of winter. Egypt is essentially a part of the desert of Sahara. Its northern portion is overlapped by the southern edge of the stormy prevailing westerlies.

564 Overflow of the Nile, Egypt, resulting from the heavy spring rains in the Abyssinian mountains.
566 Palms — producing fruit and wood in semi-arid and arid regions.
561 Agriculture in the irrigated Nile valley, Egypt.
562 Threshing beans in the Nile valley, Egypt.
563 Spinning Egyptian cotton.
569 How the Nile water is conserved for use in irrigation, Assuan, Egypt.

3. Sub-tropical Lands with No Dry Season

These districts are in sub-tropical latitudes in the southeastern portions of Asia and of North America. They receive more or less rain in winter, from the cyclonic storms of the prevailing westerlies, but usually have their heaviest rainfall in summer, with onshore winds of the monsoon type. The rainfall is abundant, and the winters are not

severe. Among the economic products are cotton, rice, sugar cane and tropical fruits.

117 Cotton, a typical crop on the warm lowlands of Gulf States,
104 Flooding rice fields, South Carolina.
105 Lowland rice, South Carolina.
107 Gathering turpentine in the long-leaf pine belt of the southern states.
118 Peanut harvest, Arkansas.
108 Gathering pineapples in semi-tropical Florida.

C. THE "TEMPERATE," OR INTERMEDIATE ZONES

The so-called "temperate" zones occupy about one-half of the earth's surface. They are belts of prevailing westerly winds; of frequent cyclonic storms, especially in winter, and of changeable weather. Seasonal contrasts in temperature are marked, and over the northern continental interiors reach extremes greater than those found anywhere else in the world. Rainfall, which comes chiefly in connection with cyclonic storms, or in thundershowers, varies greatly with distance from the ocean and with topography. Bold windward coasts in middle and higher latitudes have generally heavy, even excessive amounts; leeward coasts are less rainy; continental interiors are still drier, and may even become deserts, as in Asia and southwestern North America. Over much of these zones, rains are distributed fairly uniformly throughout the year, but on the western (windward) coasts the winter is the rainiest season, while over the interior lands most of the rain falls in the warmer months. The seasonal changes of the temperate zones stimulate man to activity. They develop him physically and mentally. They encourage higher civilization.

The "temperate" zones include a great variety of climates and of crops. In the southern hemisphere this zone is far more "temperate" than in the northern, and really merits the name.

1. Windward (West) Coasts

These have mild winters, cool summers, and abundant rainfall, fairly well distributed through the year but coming mostly in winter.

224 Great trees in the rainy forest of Oregon.
215 Lumber from the rainy forests of the northern Pacific Coast.
379 A scene in the Emerald Isle, Kenmare, Ireland.
378 Peat fuel, a product of the cool, damp climate of Ireland.
369 The trees and lakes of rainy Scotland.
373 A highland cottage, Scotland, well protected against cold and rain.
361 A picturesque bit of western England; the Lake District.
357 Wheat on the lowlands of eastern England.
358 English beef cattle, raised chiefly on the rainy western lowlands.
407 A Norwegian waterfall, characteristic of the rainy western mountains.
328 Indians in cool damp climate of Straits of Magellan.

2. Continental Interior and East Coast Lowlands

These have large seasonal ranges of temperature and sufficient to abundant rainfall, fairly well distributed through the year but coming mostly in summer. The winters are colder and the rainfall is less abundant than on the western coasts.

50 Effects of severe winter cold, Niagara Falls.
542 Snow on the roofs, Seoul, Chosen.
60 Sea bathing during the hot summer.
38 Characteristic summer landscape in the eastern U. S.
262 Nova Scotia, a favorite resort for American travelers on account of its cool summers.
148 Dikes for protection against a spring flood.
178 Plowing the soil, South Dakota.
179 Making a good seed bed, South Dakota.
184 Corn ripening in the long and warm summer of Kansas.
136 Harvesting the corn, Indiana.
160 Silage corn for cattle, Wisconsin.
147 Oats from the fertile fields of Illinois.
181 Gathering the alfalfa crop, Nebraska.
166 A potato field, Minnesota.
85 Delaware peaches.
175 Apples from the great American apple belt, which reaches from Missouri to New York.
44 Spraying the fruit trees, New York State.
47 Cantaloupes from New York state.
137 Indiana pumpkins.
112 A Kentucky tobacco field.
172 American hogs from the great central plains.
13 A climatic element in the cod fish industry. Sun-drying the fish.
162 Logging in winter when the hauling is easy, Minnesota.
1 Products of our eastern forests, Maine.
130 Tapping the sunny side of a sugar maple tree when the sap begins to flow in the spring, Ohio.
390 Vineyards of the Rhine Valley (Germany), a sheltered climatic oasis favorable for grape culture.
419 Sugar beets, a profitable crop in the relatively dry and severe climate of Sweden.
530 Japanese tea, growing on protected mountain slopes in a district with warm rainy summers.
527 Rice, an important crop on the lowlands of Japan, where the summers are rainy.
529 Japanese laborers in the rice fields; the hats furnish protection against rain and sun.
537 Mulberry leaves, used for feeding silk worms, Japan.
317 Cattle on the alfalfa lands of eastern Argentina.
413 Milking reindeer, which replace domestic cattle in northern Norway.

522 Tilling the soil on a Manchurian farm.
488 Plowing on a Russian farm.

3. Continental Interior Highlands

Semi-arid or arid, and with marked seasonal ranges of temperature. The moister portions are used for agriculture; the drier, for grazing; the driest are deserts, except where irrigation is possible.

186 Cattle on the grassy plains of Kansas.
127 Cattle drive on the Texas plains.
165 Modern dairy barns on the northern plains, Minnesota where cattle are sheltered against storms and cold.
188 Bronchos on the western plains, Montana.
183 Hogs in alfalfa pasture, Kansas.
190 Where little rain falls, but sheep find enough pasturage.
218 The immense wheat fields of eastern Washington.
177 Wheat grown in the fertile soil and favorable climate of the famous Red River valley, North Dakota.
199 Wheat raised by "dry farming" methods in Colorado, where there is insufficient rainfall for crops handled by ordinary methods.
198 Sugar beets on the irrigated fields of Colorado.
209 Where irrigation is necessary, Arizona.
210 Where the heavier rainfall over the mountains supplies water for irrigating the desert lowlands, Roosevelt Dam.
211 Spineless cactus, a new crop in our semi-arid southwest.
212 City on an irrigated desert; Salt Lake City, Utah.
213 An irrigated desert, supporting a city, with bare mountains in the background, Ogden, Utah.

4. "Temperate" Zone Mountains

These have successive vertical climatic zones, marked by lower temperatures and generally heavier rainfall than the lowlands, grading into "polar climates" above, with snow and ice, if the altitude is sufficiently great. Vertical zones of vegetation correspond with the vertical climatic zones.

For more complete statement see classification, Elevation of Land (Altitude) in this chapter.

D. THE POLAR ZONES

The "temperate zones" merge into the "polar zones" where the mean temperature of the warmest month is 50°. In general, on the polar side of this limit, forest trees and cereals do not grow. The temperatures are always low; the winters are long and severe; the summers are short; precipitation is light and mostly in the form of snow. Life is hard. The food supply is scanty and is obtained mostly by hunting and fishing. Population is sparse.

279 Winter in Labrador.
342 Ships of Peary expedition, 1901, Nuerke, Greenland.
343 Eskimos in summer clothing, and part of Peary's crew.
344 Hauling snow for water supply, Belgian Antarctic expedition.
345 Traveling on skis on the Antartic ice.
346 Amundsen, discoverer of South Pole, on Antarctic ice.
246 Alaskan dog team, and drivers.
245 Placer miners protected against mosquitoes in the Alaskan summer.

II. ELEVATION OF LAND (ALTITUDE) AND ITS EFFECT ON LIFE: THE VERTICAL CLIMATIC ZONES

From the life standpoint, the most critical change that takes place with increasing elevation above sea-level, as in going up a mountain, is the decrease in temperature. If this decrease continues long enough; i.e., if the mountain is sufficiently high, "polar climates," with snow and ice, are found in the upper slopes and at the summit. Vertical zones of vegetation, and of animal life, correspond with the vertical zones of climate. In the tropics, there may thus be a gradual transition from the dense forests or the cultivated products of the warm tropical lowlands, up to higher levels where "temperate zone" fruits and cereals are raised, and then, farther up, through forests and beyond the tree line until polar conditions of life and of climate are reached. In highest mountains of "temperate" latitudes the vertical succession of climatic and of vegetation zones is similar, but the lowest zone has a temperate flora and fauna, and the vertical range of climates is therefore from "temperate" to polar, instead of from tropical to polar. A few thousand feet of ascent on a high mountain will therefore give, in a very short vertical distance, the same series of zones, of climate, and of vegetation, as are met with in going a distance of many hundreds of miles, from lower to higher latitudes, near sea level. For high *latitude* and its influence on human affairs see classification, Earth Neighbors.

508 The mighty Himalayas, at whose base tropical products are raised on the warm lowlands of India, and whose cold summits are covered with eternal snow.
329 Monte Misti, 19,200 feet high, in southern Peru. Its summit is snow covered during the rainy season, while flowers bloom and snow never falls on the plateau, 10,000 feet lower, above which the mountain rises.
548 A tropical mountain: Mayon, Island of Luzon, Philippines. Rice and tobacco are raised at its base. Farther up, on its slopes thrives the plantain tree, from which Manila hemp is obtained. (See also 549, rice fields on the lowlands of Luzon.)
284 Threshing on the Mexican plateau. Temperate cereals are raised

here, while at the lower levels, where the temperatures are higher, tropical products alone can be cultivated.

311 Taking coffee to market on the Brazilian plateau. This plateau, 2000–3000 feet above sea level, has ideal climatic conditions for coffee, and, because of its elevation, is a far healthier place of residence for white men than the hot lowlands of the Amazon Valley.

243 The rush to the Klondike (1897–1898) across the snow-covered Chilkoot Pass, Alaska. The heavy snowfall on many mountains makes them difficult to cross in winter.

221 Rising above the snow line, Mt. Hood. The vegetation in the foreground illustrates very clearly the contrast in the vertical zones of climate.

228 The snow-capped Sierra Nevada Mountains. These mountains rise above the irrigated and fertile fields of California, to snow-covered heights which have given the range its name. See 236, 237, 238 showing the fruit industry of California.

276 The snow-fields and glaciers of the Canadian Rocky Mountains.

195 Owing to the considerable altitude, temperatures below freezing, and snowfalls, occur in the Yellowstone National Park even during the tourist season.

191 Freshly-fallen snow in Yellowstone National Park.

102 The Blue Ridge, a "temperate zone" mountain range of moderate elevation. Many lowland crops will grow here. The upper slopes of such mountains (103) are still largely forested.

388 Haying on the lower slopes of the Bavarian Mountains. Hay is often an excellent crop on mountain slopes, where climatic and soil conditions are less favorable for cereals than they are on the lowlands.

427 Glacier des Bossons fed by the snows of the high Alps, Chamonix, France. Glaciers not infrequently come down from the cold upper slopes and summits of lofty mountains into the inhabited and cultivated valleys below.

444 The trees and flowers of the valley, and the eternal snows of the upper mountain slopes, Switzerland. A striking illustration of the close proximity of very different vertical climatic zones.

445 Swiss mountain homes: The roofs often weighted down with stones to prevent damage by high winds. Wood, for fuel during the long and cold Alpine winter, is piled against the house.

448 The impressive scenery of the Swiss Alps: The Matterhorn. This mountain rises far above the fertile and inhabited valleys and lower slopes.

446 A glacier among trees and fields, Switzerland. From the eternal snow and ice of the high Alps, glaciers often descend so far down the slopes that they are surrounded by trees and grass, forming a striking picture of contrasted climatic conditions.

428 Famous Mer de Glace (River of Ice), Chamonix, France.

460 The thickly settled lowland, with favorable climate, and the deserted mountains, in the Austrian Tyrol, Innsbruck.

408 A fertile cultivated valley among bare and rugged mountains, Norway. Oats are raised in this valley, while the mountain summits are seen to be snow-covered, and trees grow on the lower slopes. In a rainy climate, like that of this region, it is difficult to dry the grass for hay. The grass is put in thin, narrow piles, held up by poles, so that the wind can blow through it.

409 Snow-covered mountains rising above a pine forest, Norway.

322 A lake, high in the Andes, near the snow-line, fed by melting snows, Laguna del Inca.

323 A station on the Transandean Railroad, between Chile and Argentina far above the cultivated lowlands and valleys. See 324 taken at a lower level, and showing a considerable contrast in climatic conditions.

525 Fuji-Yama, Japan. This mountain, 12,400 feet high, is snow-capped in winter. At its base and on its slopes there are cultivated fields.

213 Bare mountain slopes in a region of deficient rainfall, Wasatch Mountains, Utah. Compare 102 and 388 where, with heavier rainfall, there are trees.

413 The rugged slopes of northern Norway. Here, although the elevations are small, the climate is too severe for farming. The people (Laplanders) occupy themselves with hunting and fishing, and keep herds of reindeer.

430 Moderate elevations used as building sites, Cannes, France. The slopes of the hills along the famous Riviera district of France and northern Italy are much used for health and pleasure resorts, and are often dotted with beautiful residences.

8. GEOGRAPHY BY NATIONS

POLITICAL GEOGRAPHY

By E. M. LEHNERTS, A.M.

PROFESSOR OF GEOGRAPHY AND GEOLOGY, UNIVERSITY OF MINNESOTA, MINNEAPOLIS, MINN.

Political geography is one of the difficult subjects to teach because of its variableness. Mathematical geography is as fixed as the sun and the earth; physical geography is, in its laws, unchanging, but political geography changes continually. Boundaries change, colonies are gained and lost, governments are overturned and reorganized. Political geography is as changeful as man.

Governments today are world-wide. They rule great ranges of classes and people and must be adapted to innumerable conditions. It is interesting to note the extent and distribution of each great nation's possessions and the fundamental principles of the government which must fit them all. Perhaps the greatest tendency in modern life is toward democracy. It seems to float in the very air. Great nations are giving even to their far-off colonies some participation in the ruling power. Notice, for instance, the Dutch in Java, the Australian Commonwealth, the Americans in the Philippines. All the world is learning that government is for the benefit of the people "deriving its just powers from the consent of the governed."

With textbooks, paging and distribution of material are necessarily fixed, and the world-wide application of one governmental system is difficult to be shown. But stereographs and slides can be combined and recombined. For instance, when a child can see 130 stereographs picked out of 600 he will have visual teaching that the British Empire includes one-quarter of the globe, and when he studies the different parts of this Empire, he will know better than words can tell what is the result of British rule.

Best of all, these Keystone Views give us people in their daily life, and children will surely get from the pictures that government helps to make life what it is, and that, in turn,

every man helps to make government, not for himself alone, but for countless men, perhaps half way round the globe. The stereoscopic views and slides can be used to help children to realize the importance of the individual in the welfare of the nation.

THE UNITED STATES AND ITS POSSESSIONS

The United States has made such rapid progress in area, population and wealth, that it is frequently spoken of as synonymous with America. The reasons for this remarkable growth and development are many and complex and include geographic, historic, economic, industrial, racial, military and other causes.

The geographic location of the United States constitutes a great and far-reaching advantage, and one which will become more and more important as the nations of the world develop and their needs increase. Not only does the United States occupy the best part of the continent, but it is so placed on the globe as to lie between the populous regions of Europe and Asia and within favorable commercial distance of most of the countries of the rest of the world — an advantage made all the more effective by the possession of excellent harbors on three coasts, the Atlantic, the Gulf, and the Pacific.

Nature was generous when she endowed the United States. Fertile soils and favorable climates produce unequaled agricultural wealth; great forests furnish building material and fuel; abundant water powers offer unmeasured energy which will work for mankind long after coal is gone; unrivalled deposits of minerals and ores pour out vast and varied treasures. These and many other bounties of nature stimulate man to greater effort and reward him better here than in any other country on the globe.

It remained for man to multiply nature's gifts; and this he accomplished by means of inventions. Improved farm machinery and methods of agriculture greatly increased the yield per acre and the output of the country; the roller mill, cotton gin, and better machines for the manufacture of flour, cloth, etc., increased the demand for the raw products and their value and usefulness in the finished state; railways furnishing quick transportation brought producer and manufacturer together, opened otherwise inaccessible regions, and, together with the waterways, made for national union and prosperity. Add to this the influence of the school, the newspaper, the telegraph, and the telephone, and consider that this is a land of peace and good will to all, that it is a land of liberty and the home of a happy and prosperous people, and its remarkable growth is seen to be but the logical result of many and powerful causes, which, continuing to function in the future, are destined to bring even greater prosperity and happiness to the nation.

The government of the United States is a logical development of English law and custom along democratic lines. Its fundamental ideal is self-government and individual responsibility. Wherever the stars and stripes float, there the people must rule themselves. In the Philip-

pines the people are being trained for self-government either for independence or real union. This ideal of the United States has been an inspiration to the world. Other countries have followed more or less closely where America leads.

87 The United States is governed by laws made by Congress.

88 Congress consists of a Senate and a House of Representatives.

91 The laws are enforced by a President.

92 A Cabinet of ten members chosen by the President advise and assist him.

89 A Supreme Court which passes on the constitutionality of a law is a distinctive feature of the United States Government. The federal government makes the laws which apply to the entire United States.

8 Each of the forty-eight states has a legislature which makes state laws, and a Governor who executes them. Also, each state has a system of state courts.

28 The people of the United States believe in self-government; so each county, city and township has its own local government which has almost entire control of local matters.

4, 16, 28, 29, 65, etc. The people of the United States elect nearly all the officers of the federal, state, and local governments. Each officer represents the people. Any man may become an official.

243 to 246 Alaska; 259 to 261 Hawaii are organized territories. Each one has a governor and judges appointed by the President and a legislature chosen by the people. Hawaii asked to be admitted to the United States. Citizens of territories are citizens of the United States with all the rights and privileges.

87 Each territory has one representative in Congress who may take part in debate but has no vote. The laws passed by the territorial legislature may be revoked by Congress.

257, 258 Porto Ricans are United States citizens since 1917. They elect their own legislature. They have a representative in Congress who may speak from the floor but not vote. Their Governor is appointed by the President.

546, 547 The Philippines also are governed largely by themselves. They are represented on the council and have their own legislature. They also have a representative in Congress without the vote. The Governor is appointed by the President.

548, 549, 550, 551, 552, 553 The Philippine common people are backward. It is the intention of the United States to educate them so that they may develop into a self-governing people.

554 Guam is governed by a naval officer stationed there.

295, 299 Cuba is a protectorate of the United States. It is a republic with its own president and congress. It may not make any treaty without the consent of the United States, who in turn guarantee protection and a stable government.

acking the centuries of evolution they do not handle tl
ratic ideals of government so readily as do the peop
Inited States. This is true of all Latin American cot
283 The city of Mexico is the capital of Mexic
ongress meets and here the President resides.

CENTRAL AMERICA

The common people of the Central American state
norant that the governments (republic in form) a
ıstable. Revolutions are very common and very des
he common people have little share in the government.
256 The State of Panama is progressing rapidly, owin
nited States' occupation of the Canal Zone.

BRAZIL

s almost as large as the United States and has a popul
)00,000. The language of the country is Portuguese.
epublic with a constitution based upon that of the

311 The people of Brazil are mostly of Spanish, Por
Italian. There are great numbers of Germans in the
ı part. The people of the interior are mostly Indians.
ı; 308 Sao Paulo. Only the coast cities have any re
ı of education.
At Rio de Janeiro, the capital, the President resides ar
national Congress, consisting of a Senate and Ho
)resentatives, meets. The government is almost entir
tralized.

317, 319, 320, 321 Local governments are subject to inspection and regulation by the federal officials and judicial authorities.

CHILE

The Chilians are sometimes called the "Yankees of South America." They are a progressive people, rapidly advancing in commerce and industry and in government.

324 Santiago is the capital of the Republic of Chile whose constitution is patterned after that of the United States.

326, 327 An active trade furnishes communication with the rest of the world and is the main reason for Chile's progressiveness.

328 There are numbers of Indians not yet touched by civilization.

PERU

332, 333 These pictures show that Peru is using the newest farm machinery, a sure sign of progressiveness.

334 Her rich mines have attracted men from all over the world and here again we see modern machinery.

329 to 334 Peru is a republic, formed on the United States as a model. It has a President, a Congress with two houses and a Supreme Court of Justice just as we have. Local affairs are under the control of the federal government.

VENEZUELA

339, 341 There are very few pure whites in Venezuela and very few pure negroes. Most of the people are a mixed race of Spanish and Indian or negro. They are mostly very ignorant and so the government laws are poorly executed. In general the courts are dilatory and ineffective.

340 Halls of Congress. The government is a republic, modeled after the United States, but not so successful in its administration. A president and Congress are the head of the government.

338, 339, 340, 341 Only the large cities have any educational advantages.

THE BRITISH EMPIRE

Great Britain

The United Kingdom of Great Britain and Ireland comprises an area of 121,390 square miles, or about the size of the state of New Mexico, and contains a population of 45,400,000 or nearly equal to one-half of the total population of the United States.

The British Empire contains 12,800,000 square miles of land and 439,700,000 inhabitants, or about one-fourth of both the total land area and the total population of the world. Approximately half of these possessions are situated in the Northern Hemisphere and half in the southern; and so widely distributed are the various portions that almost every variety of climate and soil occurs, and almost every kind of product and natural resource can be furnished.

of the two islands, then indented their shores with goc
tocked the surrounding seas with abundant fish for foo
great forests in the part now called England.
of these provisions of nature had an important bearing
of the British Empire, but their influences developec
At first, owing to the weakness of the Britons and the st
r enemies, the water barrier was not sufficient to protect
invaders. Romans, Angles, Saxons, Danes and Normans
red, and left their impress. But the island position in tin
l a sturdy seafaring people, fishermen, traders, explorers,
:ors, and daring sailors destined to become the masters c
distinction which they attained by the destruction of the S
a in 1588, and again renewed by their victory over the F
Trafalgar in 1805.
discovery of America by Columbus in 1492 was an event o
g importance for the British Isles. Heretofore they had
ı unimportant position at the very end of the known v
fter instead of being on the outskirts of Europe, remote
ımercial activities of the Mediterranean and the continent,
the geographic center of the land hemisphere of the wo
f vantage whose importance increased as the nations and
the earth developed.
n's nearness to North America, her love for adventure an
n, her remunerative attacks on the gold-carrying galleo
ınd the lure of the imagined wealth of the New World, s
r seamen, shipbuilders, explorers, navigators, sea fighters
rs, and raised England in less than a century from a se
:itime power in 1492 to the supremacy of the seas in 1588.
refore, date the first steps in the building of the British E
: time of Queen Elizabeth and the founding of the Am

products and demanded manufactured goods. Manufacturing establishments grew up and flourished, and, thanks to British skill and invention and to the possession and low cost of coal and iron, Britain's factories soon surpassed those of any other country.

The growth of so large an empire was necessarily slow and not infrequently disputed by rival nations. But over all her continental competitors Great Britain had one immense advantage — her geographical position as an island with no land boundary to guard. The effect of this was seen in three ways: The British were often able to hold aloof from continental wars and to increase their foreign possessions and trade by sea, while their rivals were busy on land fighting one another; secondly, the British have for several centuries been able to safeguard their islands by means of naval power and so have saved their country from the wasteful destruction to which the other nations of Europe have been so often exposed; and, thirdly, naval supremacy having guaranteed the safety of her shores, Britain found it unnecessary to maintain a large standing army, and was thus enabled to turn a larger proportion of time, energy, and wealth, and almost all of her entire man power toward the development of industries and trade.

A greater danger than either the Spanish Armada or Napoleon's fleet at Trafalgar threatened Britain's maritime supremacy at the beginning of the 19th century. All ships were built of wood and England's forests were exhausted. It had become necessary to buy and bring timber from the Black Forest, via the Rhine, and from the Scandinavian countries. It is doubtful whether Britain could have competed successfully with the shipbuilding of other countries had it not been for the discovery that steel and iron made better ships than wood. Great Britain fortunately possessed vast coal and iron deposits near each other and near the sea, and found herself able to build more and better ships and at smaller cost than any other nation. Her supremacy of the seas remained assured.

While geographic factors and historic events formed a favorable foundation for the growth and development of the British Empire, the credit for its accomplishment is primarily due to the British people. Indeed, it is doubtful whether any other nation similarly placed could have accomplished as much. The vast empire was not only built, but it was built so well as to hold together in stress and storm, although composed of diverse peoples and scattered over the whole earth. In this remarkable union is reflected the British genius for colonization and government.

The English language is spoken by more people than any other European tongue. The sun never sets on the British Empire; for her possessions encircle the globe. Britain is mistress of the seas, for her ships of war have ruled the waves since the days of the Spanish Armada, and her vessels of trade have carried the bulk of the world's merchandise since the reign of Queen Elizabeth. In times of war and of peace England's power has extended to the remotest parts of the earth.

...ua and Newfoundland; 301 Jamaica; 499 to 508 In
514 Hongkong; 558 to 569 Egypt; 570 to 574 British
ca; 575 to 578 Rhodesia; 579 to 584 South Africa; 58
Australia and New Zealand. These possessions are so s
l that every variety of climate and soil occur and ain
r kind of product and natural resource. The English l
e is spoken by more people than any other European ton
y of these colonial possessions are completely self-gove
organized with a constitution modeled on that of the Uni
:s. This was the lesson England learned from the Ameri
)lution. England has gained and held many of the strate
ions of the world. This in part accounts for her expansi
of Gibraltar; 558 Alexandria; 559 Suez Canal. Th
egic positions give England control of the Mediterrane
most of the trade with Asia.
ıe Nile. The occupation of Egypt gives an entrance fr
ıorth to the heart of Africa.
)ssession of Cape Colony allowed the British to spread o
and absorb South Africa. This was the key which enabl
also to control the trade of this part of the earth.
ngkong is a British possession and a strategic point f
ncing affairs in the East.
furnishes a naval base and a strategic position from whi
nd finds entrance into Western affairs.
ol, Eng.; 351 London, Eng.; 365 Edinburgh, Scot.; 3
Ire.; 381 Belfast, Ire.; 266 Quebec, Canada; 585 Sydn
alia. British people as a whole are noted for independen
ıracter, for sagacity, courage, enterprise and perseveran
r respect for law and love of justice. These sterling qua
ave enabled British manufacturers, merchants and shi
:s to gain preëminence over all other nations in trade a
al prosperity.

374, 375, 377, 378 South Ireland has wanted home rule.
381 North Ireland has objected to home rule.
380 A convention held in Dublin (1917) with representatives from all parts and parties of Ireland is to decide its government.
363 Welch people have all the rights and privileges of English subjects.

Canada

262, 264, 267, 273, 277 Canada has a Governor-General appointed by the King of England, five years, also a Parliament of two houses. Senators are appointed for life by the Governor-General. The members of the House of Commons are chosen by the people. The lower house has the real power.
262 Nova Scotia; 264, 267 Quebec; 273 Manitoba; 277 British Columbia. Each province has almost complete local government.

India

499 to 508 In India fewer than 6500 British officials rule over three hundred millions of men.
503 Delhi is the capital. All the states of India are under the rule of a Governor-General in Council. The Governor-General, oftener called the Viceroy, represents the British sovereign and has supreme civil and military power all over India.
501 Buddhists; 503 Moslems. The Council has had both Buddhist and Moslem members. An attempt is being made to give the natives some representation in their own government.
504 Minor officials are largely natives.
506 Kashmir. Native states, as a rule, are governed by native princes with the help of British political officers appointed by the British government and residing at their courts. These rulers possess armies and revenues of their own but are not allowed to form any alliances.
509, 510 Burma since 1886 is a part of British India with a Lieutenant-Governor and Council. Formerly, it was an absolute monarchy whose king was called "The Lord of the White Elephant."

Australia

585, 586 The people of Australia are mostly of British origin.
585 New S. Wales; 586 Victoria; 588 South Australia; 589 Queensland; 590 Tasmania. These states with West Australia make the Commonwealth of Australia proclaimed Jan. 1, 1901.
587 Melbourne was made the capital of the Confederation until a new capital in a federal district could be built. Here the Australian Parliament meets. Parliament consists of a Governor-General representing the King, a Senate and House of Representatives elected by the people. The government is modeled largely after that of the United States.
586 Melbourne; 590 Tasmania. Each state has a complete local government of its own.
585 The Commonwealth of Australia maintains an army and a fleet.

periments which have been very interesting to stude
ernment all over the world.

Egypt

)n Dec. 17, 1914, Egypt became a British protect
Khedive who sympathized actively with the Germ
World War was deposed and Hussian Kemal was
with the title Sultan of Egypt.

9 For many years the British had practical control
and has done much to advance the welfare of the pe
Great Dam at Assuan is an example of what Englan
to do. In the change Turkey really lost nothing bu
'airo is the seat of government. Here the Sultan resi
land sends a High Commissioner of Egypt who is i
Viceroy with governmental power. He works th
Sultan and his Council.

2, 563, 564 Egypt, under Turkish rule, has made very l
progress. It remains to be seen what England can do.

British East Africa

? The British have a nominal control also of Uganda
lands lying between Egypt and South Africa. In t
will be seen the marks of British rule. The change
agery to civilization is necessarily slow.

The country is a source of present wealth and wi
as civilization progresses.

Union of South Africa

ıe treaty of peace which ended the Boer War was si
31, 1902. This gave the Transvaal (the Boer Counti
English. In Dec. 12, 1906, the Transvaal

Rhodesia

575, 576, 577, 578 Rhodesia is under the control of the British South African Company. They have a Council with six members chosen by the Company and seven elected by the people. Provision is made for the entrance of Rhodesia into the Union of South Africa but it is not yet considered ripe for self-government.

THE FRENCH REPUBLIC AND ITS DEPENDENCIES

France comprises 207,127 square miles and 39,602,000 inhabitants. Her foreign possessions aggregate 4,100,000 square miles and 45,000,000 inhabitants.

The geographic position of France is more favorable than that of any other European country except Great Britain. France is located in the heart of west-central Europe and is, therefore, connected by land with the nations and industrial centers of the continent. She possesses an adequate number of good harbors, and her shores face both the Atlantic and the Mediterranean. This gives her direct access to the world's most favored ocean routes to both the Far West and the Far East.

France lacks the insular security of Great Britain, but is fortunately almost encircled by natural boundaries. These promote national unity and provide a first line of defense for the country. This is particularly true of the Pyrenees, Alps, Jura, Vosges, Rhine Highlands, and Ardennes. But important breaks and passes occur, such as the Valley of the Rhone, the gap at Belfort, the opening between the Vosges and the Rhine Highlands, the gorges of the Moselle and the Meuse, and the plain of Belgium. These openings facilitate railway and road connections with the rest of Europe and furnish excellent commercial routes and military highways.

The mineral wealth of France is considerable and has materially aided her industrial development; but the latter would be far greater if her coal and iron deposits were larger. Much of the coal now used in her factories must be imported. For this reason the iron and textile industries of France cannot equal those of either Great Britain or Germany, which supply all of their own fuel. Fortunately, the coal fields of France are scattered, and, though small, are most productive in the interior where importation of coal would be more difficult and expensive.

The internal development of France has been favored by the compact shape of the Republic and by the character of the surface which is seldom seriously interrupted by mountains or impassable districts. The soil, too, on the whole is more fertile and the climate more favorable than that of her neighbors. The roadways are among the best in the world and are regarded with just pride by the people. The rivers and canals furnish a network of waterways, and, together with the railways, furnish ample means for transportation.

423, 424 Paris; 431 Nice, France. The people of France are thrifty, generous and brave. They are noted for their bright intelligence

ι ιives and the meetings of National Assembly are held.
:ional Assembly is composed of the Senate and Chamt
)uties. The officials of France are chosen by the peo
ir representatives and are responsible to the people.
The local governments of France are under the c
/er. The government is highly centralized.
'he Alps form an important barrier or natural bounda
southeast and the Pyrenees separate France and Spain.
fact that there is no adequate natural boundary bet
ınce and Germany has led to many wars and the mainten
a standing army.
eilles; 430 Cannes. France has harbors on the Med
ean Sea and on the Atlantic Ocean. This gives her acce
world's most favored ocean routes both to the Far East
the Far West and leads to her desire for colonies in Af
ria is a French colony ruled by a Governor-General assi
a Council. Laws for Algieria are made by the Nati
embly at Paris. The country has advanced and prosp
er French rule.
was declared a French protectorate in 1881. The na
is the nominal head, assisted by a Council of nine minis
:n of these are French and two are natives. The real r
resident Commissioner-General sent by the French
ıent.
co is an African sultanate under French protection. A
Commissioner-General sent by France represents the
ıat country. French rule means progress, civilization
er personal security.

of an hereditary king. The legislative body or Cortez consists of a Senate and a Chamber of Deputies. Voters are all males over twenty-five who are in full enjoyment of their civil rights and who have been citizens of a municipality.

SWITZERLAND

443, 445, 446, 447 Switzerland has the most democratic government in the world. The Federal Council is the chief executive of the federation. It is elected triennially by the Federal Assembly, which is chosen by the people. The president of the Federal Council is the President of Switzerland.

BELGIUM

Belgium is what we call neutralized territory. That is, it was recognized as a nation whose independence all the great powers had pledged themselves to respect and to preserve. It, in turn, was pledged to strict neutrality and could make no alliances. When Germany asked permission to go through Belgium to France, neutral Belgium refused and later resisted their forcible passage. The other great powers were then bound to assist her. The violation of neutralized Belgium was one of the main factors in drawing other nations into the war.

395 Brussels is the capital of Belgium. The government is a limited monarchy under a king and Parliament.

397 River Meuse and Namur. In this region occurred some of the severe fighting of the World War, resulting in the conquest of Belgium. The restoration of that country is one of the main issues in the making of peace.

HOLLAND

Holland is a little country with a wonderful history. Hemmed in the lowlands at the mouth of the Rhine, its greatest prestige has come from the sea. Hollanders, or the Dutch, are great sailors and traders, their ships being found in every port in the world. As a people they are frugal, industrious and clean. They are very independent and very brave, maintaining their national life with great courage.

399, 400, 401, 402, 403 Holland is a limited monarchy with a king and Parliament. The people are intensely loyal and interested in their government.

545 Java is a Dutch possession. It is governed by a Governor-General and a Council. The government as the Javanese see it, is carried on through a network of native officials to whom the foreign rulers are "elder brothers." There is a daily conference between the Dutch and the native chiefs and the Javanese language is always used, the Dutch not being allowed. In the administration of justice the Dutch are subject to laws of the Netherlands while the natives are under their own laws. Nearly

...ed for the possession of this little country, yet ne
:en willing to allow any one else to have it. The import
tion has safeguarded its independence.
06 Copenhagen is the seat of the Danish government. I
rk is a constitutional monarchy with a king and Rigsdag
ional legislature. The Rigsdag consists of a Landsthing
)er house, part of whose members are chosen by the k
't by the largest taxpayers and part by the people; an
lkething, or lower house, chosen by the people. Voters
male citizens over thirty years old not engaged in me
ısehold service.

NORWAY

ıy years Norway and Sweden were united under the s:
with a parliament of its own. In 1905 they separated, N
ing a prince of Denmark for its king, with the title Haal

The people of Norway are wonderfully industrious
ifty and very democratic. Women have complete suffr
may hold office. The Storthing or parliament meets an
in Christiania.

SWEDEN

tockholm is the seat of the Swedish government, whicl
)nstitutional monarchy. Here the king lives and here
, or parliament, meets. The Diet is divided into two hou
males with property qualifications have full suffrage
den. Women have municipal suffrage.

ITALY AND THE ITALIAN COLONIES

coal can be brought in ships from England for less money than it costs to send it from Pennsylvania to Duluth, water power is available, and raw materials such as silk and cotton are near at hand. For these reasons, the textile industries are rapidly growing. Moreover, certain events are pending which will tend to bring back to Italy a part of her former commercial prosperity and political prestige. These events are the rejuvenation of Russia and the probable opening of the Dardanelles; the awakening and development of the countries bordering the Mediterranean. Italy's resolve to conquer the lands bordering the Adriatic, and her larger plans for naval control of the Mediterranean; and, above all, her renewed self-confidence, intensified patriotic spirit, and increased national aspirations.

450 to 459 Italy is a constitutional monarchy. Today she is showing a renewed self-confidence, an intensified national spirit and increased national aspirations.

450 Rome is the capital. Here the king lives and here the Senate and Chamber of Deputies hold their sessions. Males over twenty-one who can read and write are voters.

454 Naples; 455 Palermo; 458 Milan; 457 Venice. Italy has a splendid location for trade.

GREECE

475 to 480 Greece too is a limited monarchy, but the people are in control. King Constantine, who opposed the wishes of the parliament and the people, was deposed and his second son was made king in his stead. The democratic tendencies in Greece are very strong.

THE GERMAN EMPIRE

The present German Empire was formed in 1871, at the close of the Franco-Prussian War, by the union of the North German Confederation and the South German States and the addition of Alsace-Lorraine. Since then the Empire has acquired extensive colonies in Africa and the Pacific, and in 1890 obtained by cession from Great Britain the island of Heligoland. The total area of the German Empire in Europe, before the war, was 208,830 square miles, and its population in 1905 was 60,641,000. Its colonial possessions before the beginning of the World War comprised approximately 1,000,000 square miles of territory and numbered about 12,000,000 inhabitants.

The German Empire occupies a less favorable position, geographically, than either Great Britain or France. It has only one coast line and that faces northward, away from the commercial regions of the world. This coast is flat and sandy, often bordered by dunes or marshes, and there are no natural harbors except the estuaries of the rivers flowing into the North Sea and the lagoons at the mouths of the rivers flowing into the Baltic. Moreover, only a few of the harbors are of sufficient depth for ships of largest size, and most of the Baltic ports are closed by ice in the winter months. It is not improbable that Germany, ham-

idustries and manufactures. Her numerous rivers and ca
g over 9,000 miles of interior waterways, carry not only
ut men and ideas throughout the land, and, like the railv
ographical and commercial bond of union for the Empir
rman people are industrious, frugal, and thrifty, and
ed by devotion to family, love for country, loyalty to l
nce to authority. Intellectually less quick and versatile
and Anglo-Saxons, they are more persevering and thorc
g the last quarter century, have made more rapid progres
s, especially applied sciences, than has any other nation. T
luced many eminent poets, writers, philosophers, scient
and captains of industry, but have been less fortunate
smen. Patronage of the fine arts has long been one of t
haracteristics, and in music especially the Germans h
an influence far beyond the borders of their Empire.
ation, industrial, commercial, political, and military and n
he German people evolved and developed a centralized sys
ization of great efficiency but out of harmony with the de
it of other countries. This system, which has come to
Prussian system, combined with over-reaching national
nd ambitions and the clashing of economic and racial in
ed in the Great War.

Reichstag-Gebaude. The German Empire is nominall
ited monarchy. The legislative body consists of the Reich
ted by the people and the Bundesrath or Federal Council
German Emperor has the executive power and is increasin
tinually. He is responsible to no one. The chief execu
er is an Imperial Chancellor appointed by the Emperor
onsible to him instead of to the people's representati

away from commercial regions of the world. This coast is flat and sandy with harbors only at the mouths of rivers. Germany wants more coast.

440, 441, 442, 446, 448 The Alps form a natural boundary on the south.

397 Belgium; 399 to 403 Holland. Germany opens to the west through Holland, Belgium and France.

468, 469 Bulgaria; 472, 473, 474 Turkey. She has steadily extended her influence southeastwardly toward the Black and Mediterranean Seas.

574 German East Africa as well as other colonial possessions were captured by the Allies in the World War. England gained most of them.

AUSTRIA-HUNGARY

Austria-Hungary is really a union of two countries under the same king who must be crowned in both countries. The two countries are very jealous of each other, keep themselves as separate as possible and have a common administration in only a few matters such as finance, war, foreign and commercial affairs. They use the same money and the same scale of weights and measures.

462, 463 At Vienna the Emperor of Austria is crowned. Here the Austrian Reichsrat meets and makes laws for Austria. The Reichsrat consists of a House of Lords and a House of Deputies.

464 In Budapest the King of Hungary is crowned. Here the Hungarian Reichsrat meets to make laws for Hungary. It is divided into a House of Magnates and a House of Representatives.

466 Bosnia; 467 Serbia; 470, 471 Roumania. Austria-Hungary constantly encroached upon her weaker neighbors, trying to make them parts of the Empire.

TURKISH EMPIRE

472, 473, 474 Constantinople is the capital of the Turkish Empire. It is a place of such strategic importance that no nation has been willing to allow any other to have it; so the weak Turkish government has been maintained. The government changed from an absolute to a limited monarchy.

492, 493, 494 Syria is a part of the Turkish Empire.

495, 496, 497, 498 Palestine also is a Turkish province. The Jews and Christians of Palestine have suffered from the cruelty of the Turks in the World War.

RUSSIA

The Republic of Russia comprises 8,754,680 square miles, an area a little larger than the mainland of North America, and a population of 176,000,000 or nearly as many people as live in North America and South America combined. Of this great total, 2,095,680 square miles and 140,841,000 inhabitants belong to Europe, and the rest to Asia.

Many geographical and political factors combined to retard the in-

and her deficient educational system.
is making strenuous efforts to rid herself of her most se
. New and capable leaders are organizing a liberal and
;overnment. The educational system is being placed on
of other countries. Transportation facilities are being
rapidly as possible. Agriculture is being advanced. M
opened to pour forth the enormous mineral wealth of
ncluding inexhaustible supplies of the most important ore
oday — iron, coal, and petroleum.
is a young nation, not so much in years as in emergence
;he is a prolific nation, having doubled her population w
She is a peace-loving nation and may yet become the d
in the accomplishment of a permanent peace — the hop

; 486, 487, 488 Slavs; 485 Jews. Russia is peopled by n
:es speaking many languages who have never been assimil
o one nation. The Fins are Mongolians. The Jews
:n persecuted in every possible way.
ograd is the capital and seat of the absolute governn
e Czar was the head of both Church and State. In resp
a popular demand, a Duma, or popular assembly, was g
people and many reforms were made. It was soon fo
t these were never intended to accomplish anything. In
lemocratic uprising forced the Czar to abdicate and a
vernment was formed.
Russia as a whole is making herculean efforts to adjust
f. New and responsible leaders are organizing a liberal
gressive movement.

516, 518, 519, 521, 523, 524 These pictures will give some idea of the tremendous change which must take place before China becomes a self-governing nation in the American way. The American government is the ideal toward which the eyes of Chinese statesmen are turned.

JAPAN

Japan is a limited monarchy whose royal family has held place for more than two thousand years. In the last sixty years, Japan has made wonderful progress in arts and industries as well as in government.

526 Tokyo is the Japanese capital. The Mikado or king is the chief executive. A legislature of two houses makes the laws. There are strong democratic tendencies which strive to make the ministers responsible to the representatives of the people instead of to the Mikado. Tokyo, Osaka and Kioto have local governments.

527, 528, 529, 530 The Japanese people are patient and persistent. They combine cheerfulness with quick-wittedness; are versatile; they have enterprise and originality as well as unexcelled powers of imitation. They are industrious, clean, kind, calm and brave and their women have always been free.

A SUGGESTION

preceding chapter, "Geography by Nations," affords an
of visualizing the extent of dominion of the leading n
rld by a grouping of the stereographs and lantern sl
ing class review or a program for a community mee
by showing the slides of the various regions with t
the explanation in accordance with the Keystone pl
ed, in addition, that the work may be made still more
ing the pupils, who give the explanatory statements
dressed in the costume of the country being presen
ation of the British Empire, for instance, by pupils
ostume of each division of the empire will do more to
ent and nature of that government's activities than an
ing from text. It would be helpful also if the pupil
ng the slides, would display to the audience wall n
charts showing the extent and relative proportion of l
on and principal products of each country.

dditional stereographs and slides emphasizing the exte
nations, reference should be had to the Keystone Vi
General Catalog, covering a world-wide series of tra
cellaneous subjects.

THE PUBL

9. EARTH NEIGHBORS

By JAMES F. CHAMBERLAIN, Ed. B., S.B.

PROFESSOR OF GEOGRAPHY, STATE NORMAL SCHOOL, LOS ANGELES, CALIFORNIA

Morning after morning for unknown ages, the sun has appeared in a blaze of glory in the eastern sky, and in the evening has disappeared with equal grandeur in the west. Night after night throughout the centuries people have marveled as the worlds have wheeled majestically across the sky. The Psalmist gave expression to the influence of these wonderful sights upon his life when he said: "The heavens declare the glory of God."

But even to primitive man these phenomena were something more than wonderful spectacles. Some of the relationships between certain of the heavenly bodies and human affairs, were very early recognized. For many centuries people have realized their dependence upon the sun. Their daily lives have been in large measure ordered by it. The moon has illuminated man's pathway at night, and the stars have guided his wanderings upon the water as well as upon the land.

The great telescopes of today, the spectroscope, and photography have done much to enlighten man regarding the earth's neighbors. Many facts as to distances, dimensions, rotation, revolution, density and other conditions have been learned.

Astronomical geography is one of the most important as well as one of the most interesting phases of geography. The range of the subject is great, including such topics as the form of the earth, rotation and revolution and their results, latitude, longitude, the zones, the tides and the solar system.

The educational value of pictures as applied to human geography is generally recognized. As applied to astronomical geography it would seem at first thought as though only pictures representing the heavenly bodies could be used. This is far from being the case. There are many scenes in the

rnishes us with both light and heat. Without the sun
ssible for animals and plants to live on our earth.

The sun, our most important earth neighbor.
Midnight sun, North Cape, Norway.

A. SOLAR EVAPORATION

(1) Solar Evaporation as Related to Industr

lar evaporation is a very important process, as it i
ın life in many ways. The farmer makes use of solar
ıring his hay and grain. Through this process the
ıer dries peaches, prunes and apricots, and converts
ıs. In many parts of the world fish are spread out
to dry, and much of the salt that we use is obtain
evaporation.

Drying codfish in the sunshine. The evaporation r
water from the fish and the salt penetrates them.
Solar method of evaporating salt brine.
Bundles of oats that have dried in an Illinois field by
Wheat drying in the shock. Wheat, like other plants
very high percentage of water. If the wheat were s
this water in the stalks and in the kernels, the grain
Drying fish on the Yukon River, Alaska.
Drying coffee in the sunshine, Brazil.
Drying sardines, Beppu, Japan.
Drying nitrate and sacking for shipment, Chile.

(2) Solar Evaporation as Related to Cloud Form

h temperature, low humidity and a rapid movement
ere favor evaporation. Thus indirectly solar

208, 218, 255, 301, 574 High temperature, wind and a dry atmosphere favor rapid evaporation.

193, 288, 291, 448, 450 As the air rises it cools and contracts, and the particles of moisture are crowded closer and closer together. Finally the moisture becomes visible in the form of fog, cloud, mist, rain, snow or hail. When this occurs, the air is said to have reached the condensation point.

257, 408, 444 Clouds are both a result and an indication of weather conditions. Sailors, farmers, mountaineers and others who live out of doors much of the time are close observers of cloud forms.

414, 321, 258, 368 When clouds obscure the sun we receive less heat from this neighbor of ours than we would if it were clear.

181, 357, 38 A cloudy day checks evaporation, and the farmer's hay or grain which has been cut and left in the field to "cure" does not dry rapidly. At such a time the wet clothes hung on the line dry slowly.

308, 314, 422 Cloudy days are not the most enjoyable for excursions and picnics.

(3) Overcoming Effects of Solar Evaporation

Where solar evaporation is excessive, plant life is restricted, and the forms that grow under these conditions are adapted to store water and to reduce its loss. In many desert and semi-arid regions man has constructed reservoirs in which water is stored for the irrigation of these lands, which thus become highly productive.

For Conditions Unfavorable for Plant Life, Water Relation to Leaf Forms, Light and Heat Relation to Leaf Forms and Food Storage see classification Plants and Plant Associations.

209 Cactus plants so developed as to store water.

210, 569 Storing water for irrigation.

198 Cultivating field of sugar beets. Frequent cultivation checks the movement of the water from the soil to the surface. This reduces the loss from evaporation.

B. SOLAR ENERGY

Although so very distant from us, the sun influences our daily lives in many ways. In fact if it were not for the sun, neither plants, animals nor human beings could exist upon the earth, for the sun furnishes the heat upon which all life depends.

Light is another blessing which we receive from the sun. But one-half of the earth can receive light at a given instant, and as the earth rotates upon its axis, there is a constant succession of day and night.

(1) Influence of Solar Energy Upon Color of Skin

The color of the skin is dependent upon certain pigment cells deposited under the skin to protect the tissues from the rays of the sun. Everyone is familiar with the way in which the skin is tanned by

ıacĸ people of tropical Africa.
atives of Rhodesia, Africa.
ypical natives of Fiji Islands.

(2) Effect of Solar Energy upon Dress

, 285 Workmen dressed in white because of high temp
, 506 Effect of solar energy upon color of garments an
of headdress, India.
, 530 Effect of solar energy reduced by use of wide hats
Filipino workman. Little clothing is needed wher
energy is great.
Effect of solar energy upon dress of African and Fiji
natives.

(3) Protecting Plants from Excessive Solar Energy

ıtense is the heat and the light of the sun in the tropica
ne of the plants require shade for their most successful
owing tobacco in shade of banana trees, Cuba.
cking coffee grown in the shade of banana trees.

(4) Releasing Solar Energy of Past Ages

and light from the sun, and a supply of moisture, are e
ıt growth. Plants, therefore, represent stored-up solar
egetation that thrived in past ages has been converted ir
oleum, thus storing vast amounts of solar energy.
ıt, the first stage in the formation of coal.
ipping coal at Hazelton, Pa.
ıer drilling and laborer loading anthracite coal, Pa.
hracite. soon to release its solar energy

246 Relation between latitude and life in northern Alaska.

343 Costumes of native Greenland girls. It has a cold climate. Very heavy clothing is needed, and this is in large part made from the skins of animals.

279 Eskimo dog team on trail, Hopedale, Labrador.

328 Indians on Straits of Magellan near Punta Arenas. The latitude is so high that the sun's rays always fall very slantingly. The weather is therefore chilly even in the summer.

344 Hauling snow for water supply. Belgica Antarctic expedition. 1897–99.

346 Roald Amundsen, discoverer of the South Pole, Dec. 16, 1911, inspecting ice field near glacier, Antarctic Ocean. Occasionally explorers spend a winter or two in the icebound polar regions. Their vessels freeze in solidly as you see in view 344. The men secure some food by hunting, but they must be very careful not to get severely frost bitten.

345 Showing a method of travel in polar regions and also a seal.

D. FORM OF THE EARTH

Until after Columbus discovered America, few people believed the surface of the earth to be curved. Now we know the earth is round and that night and day are caused by the earth rotating on its axis once every twenty-four hours.

100 Curvature of the earth's surface shown by appearance of distant ships. By observing this picture you will see that all of the nearest war ship is visible. The one at the left of this one and farther away, appears to be much lower. The more distant the ship, the smaller the part that can be seen.

Since approaching and receding ships on all of the oceans present this appearance, this is taken as a proof that the surface of the earth is curved. Objects upon a very level plain appear and disappear in the same fashion.

E. LONGITUDE AND TIME

353 Chronometer by which the world's time is measured, Greenwich, England.

F. CHANGE OF SEASONS

You have observed that during the winter the sun appears lower in the sky than it does during the summer. In winter the sun's rays fall upon the northern hemisphere more slantingly than they do in summer. Because of this we receive less heat from the sun during the winter (although closer to it) than we receive during the summer.

The change of seasons which occurs year after year with never failing regularity, is due to the changing relations between the earth and the sun. As the earth rotates upon its axis, it is also revolving about the sun. When the sun's rays fall most directly in the northern hem-

ce forms where the water does not flow too swiftly. W
snow is quite wet it clings to the branches of the trees
see in the picture, and sometimes breaks them.

II. THE MOON

noon is much nearer to us than is the sun, and yet its d
ıe earth is nearly ten times as great as the circumfere
h at the equator.
es furnishing light to the earth at night, the moon is th
ducing power. Tides are related to the shipping interest
the world. You see, therefore, that the moon is related
es in more than one way.

A. PHASES OF THE MOON

xplanation of the Moon's Phases see descriptions for
and slides.

e full moon.

on at age of seventeen days. Taken three days after th
f full moon.

B. LUNAR ILLUMINATION

he earth, the moon receives its light from the sun. A p
t is reflected, and when the side of the earth upon whi
rned away from the sun, the moon illuminates it.

onlight on the Rhine, Bingen, Germany. Traveling up
ater, as well as traveling upon the land is made much

cause of this, goods and people can be easily loaded or unloaded at any time.

III. PLANETS

Eight large bodies and many smaller bodies revolve about the sun. These are called planets. The eight large planets named in relation to their distance from the sun are Mercury, Venus, the Earth, Mars, Jupiter, Saturn, Uranus, and Neptune.

A. MARS

Mars is one of the most interesting of our neighbors. It is not so near the sun as are Mercury, Venus and the Earth, but it is much nearer the sun than are the other planets. A day on Mars is almost exactly the same in length as a day on the earth, but the year is nearly twice as long as ours.

596 The planet Mars. See descriptive text on view.

B. SATURN

Saturn is immense in size. It is more than nine times as far from the sun as is our planet. It is interesting to know that the day on Saturn is less than half as long as our day, but the year is equal to about twenty-nine of ours.

The rings shown are composed of countless meteors which are in reality very small moons. These extend outward to a distance of about 50,000 miles from the surface of Saturn. In addition, the planet has 10 larger moons.

597 The planet Saturn, one of our distant neighbors. See descriptive text on view.

C. URANUS

This planet is at a tremendous distance from the sun, about 19 times as far as are we. It is faintly visible to the naked eye, however, which tells us that it is of great size. Uranus has 4 moons or satellites, two of which are shown. Comparatively little is known about this very distant neighbor of ours.

598 The planet Uranus and two of its moons. See descriptive text on view.

IV. COMET

Comets have been observed for many centuries. The people of olden times regarded them as fore-runners of evil, and as late as 1860 great numbers of people in Europe were terrified because of the appearance of a very bright comet. In one country a statement was issued to calm the fears of the people. It read as follows: "The star threatens; trust only God. He will make all right." Are you not glad that you

at a very great speed. When it approaches our p
, it is pulled by the force of gravity to the earth. Wh
act with the earth's atmosphere, a great heat is de
and the meteor burns up in whole or in part before s
surface.

eteor in constellation of Orion. See descriptive text o

HISTORY AND CIVICS

INTRODUCTION

By ALBERT BUSHNELL HART, Ph.D., Litt.D., LL.D.
PROFESSOR OF GOVERNMENT IN HARVARD UNIVERSITY

The old fashioned view of history is that it is made up of the heaping together of a multitude of units; it is supposed to be like a wall built of bricks and stones of varying size, every one of which must appear in the face; history should be something that can be memorized and recited like a multiplication table. Wide-awake and modern teachers and writers nowadays look on history rather as a grouping of materials of many kinds, which are so laid together that all are used in the wall, while only the most striking are selected out of the immense mass and placed in view.

This idea of what might be called "composite history" carries both pupil and teacher away from the notion that history is simply a succession of personalities and events. History of the modern type takes account not only of the leaders but of the mass of the people, notes not simply episodes but tendencies. To the true historian of the United States, Congresses, Presidents, Constitutions, statutes, legal decisions, wars, battles, sieges and treaties are only the external part; they are of value only so far as they illustrate the great theme of the nation's growth, the nation's mind and standards.

The proper aim of all teaching of history is to make young people realize that their country in times past has been carried on by people like themselves. That involves making them familiar with the social and economic life of the past, as well as with political events. Modern historians recognize that the first necessity for a civilized community is that people should be able to make a living in the midst of a varied and confused life. Often the characteristic things are the everyday pursuits. Raising corn is a more important part of the nation's activities than making rifles. The district school, as an institution, has had more influence on the United States than the Supreme Court. The modern teaching must therefore touch many sides of the national experience.

ıarly adapted to school use. The units of the
can be combined and recombined so as to il
variety of interests, scenes and processes.
: history, the Keystone system is especially c
ıelpful because it helps to weld together in
; the scene and the event. The Declaration
:nce means twice as much when the Liberty B
ı relief. The economic side of slavery is emph
:ure of negroes working in the cotton fields. (
ıdency, the Philippines, is brought home to us
)graphs of the life of the Filipino peasants.
'ics is a subject notoriously hard to make clea
It is worked out more in men's minds than
les as the attack at Gettysburg or the captur
ɔ. Nevertheless the application of governmen
illustrated, in a great variety of subjects, suc
)l of territory, the encouragement of agricul
tion of fisheries, mining trades, and transportati
: method within which the Keystone Views
d has been developed in detail by the Comr
of the American Historical Association, 1909.
puts it: "In order to secure satisfactory resi
larly and sympathetic teacher needs suitable too
, maps, charts, objects, and pictures are absolute
- the child craves more life. He [illegible]

10. FOREIGN BEGINNINGS OF AMERICAN HISTORY

By HUTTON WEBSTER, Ph.D.

PROFESSOR OF SOCIAL ANTHROPOLOGY IN THE UNIVERSITY OF NEBRASKA, LINCOLN, NEB.

The views in this section have been selected with the purpose of setting forth what may be called the foreign background of American History. It is difficult to realize that all history is related, and that in order to understand the story of any nation we must trace its people with their habits and cusoms to their sources.

For example, America was settled by people from Spain, England, France, Holland and other European countries. Every one of these nations derived its civilization largely from Rome and Roman influence can still be seen especially in government. Now Rome, in turn, took her ideas from Greece. But civilization did not originate in Greece, for the Greeks learned very many things from the Phœnicians who had been influenced by the people of the Tigris-Euphrates Valley and by Egyptians who occupied the Valley of the Nile.

Pupils in American History who follow only the course of events in the New World in the last four hundred years sometimes fail to see that American history is really a continuation of a growth which had its beginning many centuries ago in the Old World. Each nation modifies what it receives to suit its own ideas and needs, and yet, in one sense we may say that the history of the United States and of every other modern nation began with the beginnings of civilization.

I. THE ORIENT

Civilization first rose in the valleys of the Nile and of the Tigris-Euphrates rivers. The Egyptians and Chaldeans were therefore the teachers of the ancient East. Their arts and sciences spread by conquest, trade and travel, entered Syria and Asia Minor and in time became the common possession of the Oriental people.

...city of the Orient where sea route
routes converged. Alexandria in ancient times
nowned seat of learning with a library and mus
tracted scholars from all parts of the civilized wo
central point from which learning of all kinds wa
the world.

b. Syria

ying between Egypt and the Tigris-Euphrates valle
rrun and conquered at various times by both people, s
lizations. The northern part was the home of the a
is, the first sailors, the first commercial people of the w
kers of the first alphabet from which all other alphab
ived.

he southern part of Syria was occupied by the Jews
ie our ethics and our religion. The Bible, both Old anc
its, was written by Jews and today the Bible is a direc
dern life. Today many Jews and Syrians have fou
erica.

Beirut was one of the most ancient and important of t
settlements. It formed a center from which Orien
and culture spread westward over the Mediterranea
ern city is connected with Damascus by a railroa
Lebanon Mountains.

Damascus, the "Pearl of the Orient" is one of the
in the world. It is frequently referred to in the B
situated on the old caravan route by which trade w
between India and China and the countries of Eu
Southwest Asia was taken by the Mohammedan Tur
van route was closed to Christian Europe. Then ca
for a different route to India and China which re
discovery of America.

David, king of the Hebrews, chose for a [illegible]

497 In the background the village of Nazareth, looking much the same, no doubt, as it did at the time of Christ.

c. Asia Minor

The culture of the Greeks and later the Christian religion spread through the countries of Asia Minor and later over Europe.

489 The Greeks were the first to plant colonies on both sides of this narrow strait which separates Asia from Europe.

491 Tarsus at the time of Christ was an important center of Greek learning and culture. Here lived "Saul of Tarsus," afterwards the Apostle Paul, who carried Christianity to the pagans, or Gentiles, of Asia Minor, Macedonia, Greece, and Italy.

II. THE MEDITERRANEAN WORLD

Oriental civilization passed at length from the East to the West and centered in the basin of the Mediterranean. The situation of Greece at the threshold of Asia, with its best harbors and most numerous islands on the eastern coast, enabled the country early to receive and profit by all the culture of the Orient. Italy, on the other hand, looked away from Greece and the Orient toward Gaul, Spain, and northwestern Africa. Hence civilization, moving slowly toward the setting sun, reached Italy from Greece only at a late period of ancient history. Eventually, however, the extension of the Roman Empire over the barbarian peoples of western Europe widened the area of the civilized world to the shores of the Atlantic.

a. Greece

Some writers go so far as to claim that every good thing in our western civilization came to us through the Greeks. Literature, art, government, science, architecture, philosophy, all were highly developed in Greece and have come directly to the modern nations. Very many authorities claim that the Greek civilization was the best the world has known.

475 In art, in literature, in science and in philosophy, the Athenians were teachers of the world. In Athens were the most perfect examples of architecture and sculpture; drama, oratory, philosophy and poetry reached a degree of excellence that has never been surpassed. In Athens democracy was born.

477 Next to Athens, Corinth was the most important commercial city in Greece. The Romans destroyed it in the second century B. C., but it was rebuilt by Cæsar in 59 B. C. and became one of the great cities of the Roman Empire. At Corinth was established one of the early Christian churches. To the members of this church St. Paul wrote two letters which, under the title "Epistles to the Corinthians," form an important part of the New Testament.

478 At Olympia in southern Greece, the Olympian games in honor of

Zeus were held every fourth year. Many splendid buildings including the Stadium for athletic contests, the Hippodrome for chariot races and the temple of Zeus, covered the site. Only Greeks were allowed to compete, but people from all over the world came to the games. Here treaties between nations were read, poems were recited, artists came to exhibit and to study the athletes as models and goods from all over the world were displayed for sale. When these visitors returned home they carried with them bigger and broader ideas, better knowledge of people of other countries and so civilization spread.

b. Italy and Sicily

Sicily was settled by Greeks and for a long period was the center of trade and learning in the west. It was finally conquered by Rome and became the first Roman province.

During the Roman empire, the other cities of Italy were overshadowed by the dominant power of Rome, but during the middle ages such cities as Florence, Milan, Genoa kept alive and fostered learning and industrial arts and transmitted them to the modern nations. During the middle ages, Venice, Naples, Genoa and others were the great commercial centers of the world trading with the Orient. Very many great navigators, as Columbus, the Cabots, Verrazano and Amerigo Vespucci were Italians. When the trade of these cities was interrupted by the capture of the eastern routes by the Turks, they began to think of other routes and this resulted in the discovery of America.

455 Palermo is the largest city and the commercial center of Sicily. From this port start most of the Sicilian immigrants to the United States. In medieval times Palermo was even more important than now, for both the Moslems and the Normans made it the capital of their possessions in Sicily.

454 Naples, the ancient Neapolis, was one of the first Hellenic colonies in Italy. From the eighth century B. C. onwards it formed a center of Greek culture and even today it possesses a large Greek population. Many Italians sail from Naples to make their homes in the United States.

456 The Florentines in the Middle Ages were renowned for their banking houses and manufactures. Florence was one of the cities which perfected banking systems and book-keeping. In Florence lived the Italian scholar Paolo Toscanelli to whom Columbus wrote for advice as to sailing across the Atlantic to Asia. Toscanelli replied with a letter and a map. Amerigo Vespucci for whom America is named also was a native of Florence. He lived in Cadiz, Spain, when Columbus started out. In 1501, in the service of the king of Portugal he made a voyage in which he touched South America. Verrazano, a Florentine navigator in the employ of France, sailed for America in 1524.

457 During the Middle Ages, Venice became the greatest city of the Mediterranean region. She had many possessions and ships of every nation crowded her quays. Her merchants went every-

where and her sailors were among the best in the world. Marco Polo whose writings had so great an influence on Columbus, was a Venetian. Also John Cabot the discoverer of the continent of America was a Venetian citizen in the English service.

c. Rome

The countries of modern Europe, with the exception of Russia, are parts of the old Roman empire and a very large part of law as we know it is derived from the old Roman law. The French, Spanish, Portuguese and Italian languages are almost purely Latin while English is, roughly speaking, about half Latin.

Rome became also the center of the western branch of the Christian Church and from Rome came the influences which christianized the people of Europe. Every day, in untold ways we feel in our daily lives the influences of Rome.

450 No other city fills so large a place in the world's history.

451 St. Peter's is the largest Christian church in the world. It was partly to extend the Christian religion that Columbus made his voyages.

d. Constantinople

472, 473, 474 For many years Constantinople was the head of the Roman Empire and the Christian Church. The Emperor Justinian at Constantinople finally had the codification of the Roman law completed. When the Turks captured Constantinople and the east, merchants of Venice and Genoa were compelled to look for other routes to China and the Indies.

III. WESTERN EUROPE

Within what had once been the Roman Empire new European nations grew up and rose to importance during the Middle Ages. At the close of medieval times came the discovery and settlement of America, a continent whose aboriginal inhabitants could offer little resistance to the explorers, missionaries, traders, and colonists from the Old World. The Spanish and Portuguese in the sixteenth century followed by the French, English, and Dutch in the seventeenth century, repeopled America and brought to it European civilization. Europe expanded into a Greater Europe beyond the ocean.

a. British Isles

Many of the early explorers, like Drake, Raleigh, John Smith, were Englishmen. The original thirteen colonies of the United States were settled mostly by people from the British Isles. They brought with them their English ways of living, their English learning and religion, and especially their English theories and practices of law and government. These ideas had a new growth in America, new ideals developed and now American democracy is spreading all over the earth.

347 Liverpool is the world's principal seaport and the terminus of many steamship lines, including those to the United States. The commencement of the prosperity of Liverpool dates from the latter part of the seventeenth century.

348 London Bridge, London, England.

350 In Westminster Abbey were crowned the kings who ruled the English Colonies until 1776.

351 London during the nineteenth century was the money center of the world.

352 Here and in the House of Commons were passed the Navigation Acts, the Stamp Act, the Townsend Acts and all the other bills which led up to the Revolutionary war which separated the United States from England.

353 A view showing the large chronometer clock by which the world's time is measured. As is well known, British and the majority of foreign geographers reckon longitude from the meridian of Greenwich.

354 Shows the house, restored in 1857, in which was born the poet whose genius transcended national boundaries and made him a citizen of all the world. The three-hundredth anniversary of Shakespeare's death was appropriately observed in 1916 in the United States. Many of our early colonists came from homes of this kind to live in the wilderness in America. No doubt many early settlers in their log houses were homesick for the homes they had left.

355 The cottage stands in substantially the same condition as when Shakespeare courted here his future wife. It is still occupied by a descendant of the Hathaway family.

360 York, the ancient Eboracum, formed the capital of the Roman province of Britannia. In York Constantine the Great, whose conversion to Christianity paved the way for the triumph of that faith over paganism, was proclaimed emperor. Most of the very early colonists came from York.

361 It must have been hard to leave a developed country with its homes and cultivated fields and come to a perfectly new, wild land.

365, 366, 368, 372, 373 Among the early settlers in America were many Scotch people. With their thrifty ways they made very desirable citizens.

374 Queenstown is a port of call for American mail steamers and an emigration station of the British government. The terrible famine in Ireland in 1846 started a great emigration movement, and between that date and 1905 nearly five million people left the country. Most of them came to the United States. In recent years, however, the number of Irish emigrants has greatly declined.

375, 378 There are said to be more Irish in America now than there are in Ireland.

380 The Northmen, or Vikings, as they are often called, conquered a considerable part of Ireland during the ninth century. The first

cities on Irish soil, including Dublin and Limerick, were founded by the Northmen.

b. Holland

New York was first settled by the Dutch whose influence is still felt. From among the descendants of these Dutch settlers have come very many of our prominent men, as for instance, Theodore Roosevelt. The Pilgrims before coming to America had taken refuge in Holland.

399, 402 Thrifty, industrious and clean, the Hollanders have helped in the development of our country.

400 Among Dutch seaports Rotterdam is second in importance only to Amsterdam. It was a Dutch vessel that brought the first slaves to America in 1619.

c. Norway and Sweden

The first people who came to America were Norsemen, led by Eric the Red, in 1000 A. D. They made no use of their discovery however. The cold climate and poor soil of the Scandinavian peninsula caused the people to become men of the sea. A greater influence came to America from the Northmen indirectly through England and France. Great numbers of Norwegian and Swedish immigrants have settled in western New York, Minnesota and the northwest. They are very prosperous.

408, 409 Typical scenes in the country which sent out the Northmen.

418, 419 Between 1638 and 1647, Swedish people established five or six trading posts along the Delaware; but as the home government made no provison for their defense they were easily captured by the Dutch in 1655.

d. France

Cartier and Champlain were the first French explorers. People from France first settled Canada and the Mississippi Valley. Indeed the laws of Louisiana are based upon the French code instead of the English. France sent money and men to help in the American Revolution and later, inspired by the example of the United States, set up a republican form of government.

421 Paris in Roman times was only a little settlement on an island in the Seine. The Romans called it Lutetia Parisiorum, the capital of the Celtic tribe of the Parisii. The city became the capital of the French kingdom in 987, when Hugh Capet, founder of the long-lived Capetian dynasty, became king of France.

422, 424, 425 French people coming to America brought with them French ideas of architecture, art and science. Paris was the capital, the residence of the French kings who ruled so autocratically. French colonies in America had almost no self government.

e. Spain

No European country has had greater influence upon the western continent than Spain. The early discoverers and explorers were nearly

all Spaniards or in the Spanish service and that nation obtained control of the lands from California to the Straits of Magellan. Later Spain lost all this territory yet it is still called Spanish America because the Spanish language and customs prevail and the ruling people are either wholly or in part of Spanish blood.

433 Shows the monument in honor of Columbus. Barcelona was an important city in the Middle Ages. Its merchant ships traded in the North Sea, the Baltic, and the Mediterranean. The discovery of America struck a blow at its prosperity, by transferring commercial supremacy to the seaports of Western Spain. In the nineteenth century the city became again a leading center of Spanish trade and industry.

434 Burgos, showing the Cathedral.

435 Panorama of Madrid.

436 The Alhambra is a wonderful building in Moorish architecture, the palace of the ruler when Granada was the capital of the Moorish kingdom in Spain. Columbus followed the court of Ferdinand and Isabella to the camp before Granada. He was in time to witness the surrender of the city. He beheld Boabdil, the last of the Moorish kings, sally forth from the Alhambra and yield up the keys to a Christian king and queen. Ferdinand and Isabella then listened to the plans of Columbus.

f. Germany

387, 388, 389, 390, 393 While Germans were not among the discoverers and explorers of America, German settlers began to come at a very early date, especially to Pennsylvania. Today a vast number of American citizens are of German descent.

383, 384, 385 The German autocracy and militarism have compelled the United States to enter the World War.

g. Africa

570, 572, 577, 578 The ten million negroes of the United States did not come from a civilized country as the white people did. At the time of their emancipation and enfranchisement many of them had not advanced very far in civilization. Here is a background for the "negro problem" which will take the best thought and work of the best people of both races if it is properly solved.

11. FOUNDATIONS OF THE AMERICAN NATION

By ALBERT BUSHNELL HART, Ph.D., Litt.D., LL.D.

PROFESSOR OF GOVERNMENT IN HARVARD UNIVERSITY

GENERAL PURPOSE

The purpose of this section is to introduce the pupil to the formative period of American history, extending from the earliest discoveries by Europeans to the organization of the federal government under the constitution of 1787. This naturally includes the physical background of American history — the face of the country, then the original inhabitants, and finally some of the scenes of the Colonial and Revolutionary history.

A. LAND

A necessary foundation for the study of Colonial and later American history is some knowledge of the land in which we live, its scenery, its products and its capacities. The Keystone Views are rich in this kind of illustration.

(1) Surface

279, 117 Every kind of climate is found in the American Continent giving a wonderful variety of productions.

262, 38, 73 In the east, most of the land is undulating with broken country and numerous low mountains.

102, 101 The eastern mountains are usually rather low, parallel ranges with flat tops.

1, 2, 70, 103, 107, 130 The whole area was originally heavily wooded except comparatively small "intervales" or flats.

113 Trees had to be cut away. The early settler's home was the log cabin.

2, 189, 196, 232 All over the country wild game was very abundant. The beaver was especially sought. The settlement of Canada, the Great Lake region and the exploration of the Upper Missouri country were largely influenced by the trade in beaver furs. Wild animals were valuable for food both to the Indians and the early settlers.

38, 39, 51, 101 A plentiful rainfall causes full streams, but very few of the eastern rivers cut through the Appalachian Highland.

43, 48 The Mohawk River flowing east from the Lake region to the Hudson, made a valley through which a canal and railroads have been easily built.

264, 265, 267, 157, 48, 154 The St. Lawrence and the Great Lakes with the canals which have been built form one of the greatest inland waterways in the world.

49, 50 The most wonderful of all waterfalls, lying between Lake Erie and Lake Ontario breaks the navigation of the St. Lawrence system. Many interesting events of Colonial history are connected with these two lakes and falls between them, such as Champlain's and later La Salle's expeditions, Hennepin's visit and the French and Indian War.

61, 170, 174, 120 The Mississippi River valley contains nearly a million square miles of land. The soil is fertile, climate suited to the growth of vegetation and communication was easy. No other land of its size is so well suited to the uses of mankind.

3, 4, 69, 70, 76, 155, etc. A vast mineral wealth underlies a large part of the country.

27, 13, 25, 26, 52, 100, 106, 264, 267 Splendid harbors encouraged commerce.

(2) Trees

1 Timber was one of the important products of the New World. Masts and materials for ships and houses were exported from early times. New England built ships which traded in every port of the world.

107 The pine trees of the southern states yielded rich supplies of timber, turpentine, tar, etc.

103 In Colonial times all the iron was smelted from charcoal made in such pits.

130 Also the Indians taught them to make maple sugar.

175 Apple trees brought from Europe were planted by the colonists. You can hardly imagine how they waited for the first fruit from these early trees.

(3) Agriculture

147 The early colonists brought grains, such as wheat and oats, with them and they soon became staple crops.

137, 184 The Indians showed them how to plant and raise corn, the native American grain. It became a principal food.

112 Tobacco was the principal money crop of the South in Colonial times. In order to get a monopoly of the American tobacco trade, King Charles I called a General Assembly to meet at Jamestown. The holding of this assembly established the precedent for summoning legislative bodies in all the colonies.

104, 105 Rice was a staple crop in South Carolina in the Colonial period. The planters greatly desired slaves for work in the rice fields.

117 Cotton also was raised but it did not become very profitable until the invention of the cotton gin by Eli Whitney in 1793.

173 This picture may remind us that in Colonial times every household raised its own wool which the women spun, colored, wove, and made into garments by hand. Wealthy people imported fine cloth.

185, 183, 173 These can not be called Colonial pictures but they will make us remember that the colonists raised their own animals for meat and milk. They made their own butter. Corn meal mush and milk was a highly valued article of food. Every family salted its meat for winter use.

258 Throughout the Colonial period, sugar cane was an important product of the West Indies. Great quantities of molasses were brought to New England as the raw material for rum. When the English parliament laid a tax on molasses, the Americans smuggled.

B. ORIGINAL AMERICANS

(1) Eskimos

343 The Eskimo race is probably not Indian in origin. With some additions of modern woven goods the dress of the Eskimo nowadays is about the same as when the Northmen first came into contact with them.

(2) Indians

(*a*) *American Indians*

American history has been much affected by the native American tribes. There were probably never more than a few hundred thousand Indians in the area covered by the United States. The Indians seem at first to have been friendly and usually it was the white man's treachery and cruelty which changed the Indians into bitter enemies. Most of the tribes have died out; others have been exterminated or assimilated.

98 A modern staging of the celebrated story. The saving of John Smith saved the Jamestown colony.

265 The Iroquois lived in what is now New York. When Henry Hudson was on the Hudson River he made friends with these Indians. At the same time Champlain was exploring Lake Champlain and he killed a few Iroquois thereby making them enemies of the French. These Indians always sided with the Dutch and English against the French and helped to prevent the French from gaining control of America.

263 These people do not look much like the "savages" of Colonial history. The tent of bark or skin was the home known to most of the Indians in the northern part of America.

204 This picture shows the outfit of brave, squaw, papoose and dog. Horses were brought to America by the European settlers and were adopted by the plains Indians.

182 The powerful Sioux tribes ranged from Minnesota to Montana; down to 1876 from time to time they waged war against the whites.

wigwam he departed. The conical Indian made of skins or cloth, sometimes of bark, is a comfor house. The canoe is one of the important Americ tions.

"Brought forth food and set before them." Some In wear the magnificent feather headdresses enjoyed by the tribes.

(*c*) *Indians Farther South*

n the southwestern United States and thence farther soutl ed a more elaborate and advanced state of life. Coronad nd the ancestors of the present Zuni Indians living in ston h as are still occupied.

Cliff palace in the Mesa Verda. Among the most in memorials of the Indians are the cliff dwellings, evider when the inhabitants were hard pressed by enemies in country. The more important groups of such dwellings served as national monuments.

Mexican musicians and dancing girls. Probably most people are of Spanish descent, many of them mixed wit Indians. The customs of Spain and of the ancient inhab Mexico are mingled in these people.

Tortilla making, Salvador. These people are probably w nearly pure Indian. They are of the same stock as th Nicaraguans and Panamanians.

Natives near wall of Incan palace, Cuzco. These Indians rect descendants of the Peruvians who were conqu Pizarro in 1528. They are standing under one of the m nificent walls ever constructed by human hands, a wond ample of the wealth and skill of the

256 In 1543, Balboa crossed the Isthmus of Panama somewhere a little south of where the canal now is, and saw the Pacific Ocean for the first time. In reporting this discovery, he recommended that a canal be dug connecting the Atlantic and Pacific Oceans.

280 Cortez landed in Mexico and named the place where he landed, Vera Cruz.

282, 283 Cortez with his small army captured the city of Mexico.

228, 209, 207, 241 Cabeza de Vaca, Narváez, Coronado and other Spaniards wandered through the southwest and claimed it for Spain. Coronado described the "crooked back oxen" (232) which he found.

108, 109, 110 Through Florida, Ponce de Leon sought the fountain of perpetual youth.

120 De Soto with his six hundred knights wandered from South Carolina to Arkansas. De Sota was buried in the Mississippi River and his men voyaged down the stream to its mouth and back to the Spanish settlements in Mexico.

263 Jacques Cartier, the first great French explorer, found his way through the Strait of Belle Isle and landed on Prince Edward Island. He then returned to France.

264, 265, 267 The next year he sailed up the St. Lawrence till stopped by the Lachine Rapids. He passed the bluff where Quebec stands and gave the name Mount Royal to the high hill at whose base Montreal stands. He stopped to barter for furs at the Indian villages which occupied both these magnificent sites.

262 As early as 1604 French people settled in Acadia, now Nova Scotia.

264 Quebec was founded by Champlain. It was attacked by the English several times and was finally captured by Wolf in the French and Indian War.

61 Pittsburgh, Pa. This position was a strategic one in Colonial history and fierce battles were waged between the French and English for its position.

100 The first English settlers passed through Hampton Roads.

98 If it had not been for the resourceful leadership of Captain John Smith, the colony at Jamestown could not have survived.

113 The first homes were log cabins of the rudest sort.

96 This is the type of home occupied by rich planters of a later day.

112 Tobacco became the chief source of wealth, and was largely used instead of money.

117 (see 572) Negro slaves were first brought to Jamestown in 1619.

25, 39, 51 When Henry Hudson first entered this great bay and river, it presented a vastly different appearance, for it was all wild country.

13 New England was rich in harbors and lumber so the New Englanders became fishermen and sailors.

8 The Old State House has been the historic center of many stirring scenes. From its balcony the repeal of the Stamp Act was proclaimed and at the end of the Revolution peace with England

was proclaimed from the same place. Directly in front of it occurred the Boston massacre.

7 Faneuil Hall was called the "cradle of Liberty" for in it before and during the Revolution were held important political meetings. After the massacre at Boston citizens under Samuel Adams met in Faneuil Hall and demanded the removal of British troops.

6 From the tower of Old North Church was hung the signal lantern which sent Paul Revere to rouse the minute men.

10 Here the minute men first opposed the English soldiers.

"By the rude bridge that arched the flood,
Their flag to April's breeze unfurled,
Here once the embattled farmers stood
And fired the shot heard round the world."— Emerson.

9 When Washington was sent by Congress to take command of the Americans who were around Boston, he established headquarters in this house.

80 Old Liberty Bell in Independence Hall, one of the most prized possessions of the nation. Independence Hall was erected 1729–34. In it the Continental Congress met, Washington was made commander-in-chief of the American Army in 1775 and the Declaration of Independence was adopted on July 4, 1776.

39 West Point was the American stronghold on the Hudson. Benedict Arnold made an attempt to give it into the hands of the English.

37 In this house built by Jonathan Hasbrouck, General Washington wrote this famous letter of rebuke to Colonel Lewis Nicola who on behalf of several army officers suggested that he assume the title and office of king.

12. DEVELOPMENT OF OUR NATION

By H. MORSE STEPHENS, M.A., Litt.D.

PROFESSOR OF HISTORY, UNIVERSITY OF CALIFORNIA, BERKELEY, CAL.

More and more we are coming to realize that the political life of a country is very largely controlled by its economic development and so wars are not considered the chief subject matter of history. Children are not now expected to learn long lists of battles and dates, nor to remember isolated political facts. Instead, they are led to find the causes and results of political life in economic conditions. These views are especially rich in suggestive material which will help children to understand the causes and results of historical facts.

I. EARLY NATIONAL PERIOD

A. POLITICAL EVENTS

1784–1846

96 After the Revolutionary War, Washington retired to his beloved home, Mt. Vernon, where he lived the life of a contented planter.

29 On the 30th of April, 1789, Washington took the oath of office. He stood on the balcony of the old Federal Hall, whose site is now occupied by the New York Sub-Treasury building. New York was the temporary capital.

90, 93 In 1790 the place for the capital of the United States was chosen. The plan for the city was drawn by L'Enfant, a French architect. In 1790, instead of the streets and buildings shown in these views, there was nothing but virgin forest.

91 John Adams was the first president to occupy the White House. At that time the city of Washington contained the White House and Capitol, both unfinished, and two or three big bare boarding houses.

87 When Congress met for the first time in the capitol, the roof was lacking and a huge canvas tent was spread to protect the lawmakers. The first capitol was burned in 1814 when the British captured Washington.

88 Nearly all the great lawmakers of our country have sat in this room. Here Daniel Webster, John C. Calhoun, Henry Clay,

John Quincy Adams have worked. Here were discussed the Alien and Sedition Laws, the Missouri Compromise, and here has been read every President's message except Washington's.

89 The Supreme Court is the unique feature of the United States government. No other nation allows a court to declare a law null and void. The great Chief Justice John Marshall, by his decisions greatly built up the feeling of nationality in the United States.

92 Cabinet meetings have had wonderful influence upon United States history. Differences of opinion concerning a United States Bank were held by Hamilton, the first Secretary of the Treasury, and Jefferson, the first Secretary of State. The people of the country also divided on this matter. In this way the great political parties of the United States originated.

38 From 1784 to 1846, the United States was mostly an agricultural country with few large cities.

71 This was the usual method of conveyance.

B. SOCIAL AND ECONOMIC CHANGES

1789–1846

During this period the United States was an agricultural country. Fields were small for they must be planted, cultivated and the harvest gathered by hand. There were in the beginning almost no factories. Practically all work was handwork.

104, 105, 112 Tilling fields like these fostered slavery.

117 At the beginning of this period little cotton was raised because the work of removing the seeds by hand was difficult.

125 The invention of the cotton gin made the raising of cotton immensely profitable as a gin could clean a thousand pounds a day while a man could not clean more than one or two. Negro labor became very valuable to the planters, so the gin fastened slavery on the United States.

124 After the invention of the gin, cotton became the chief product of the South.

119 In 1791, America exported 189,000 lbs. of cotton. Nine years later in 1800, we exported nearly 20,000,000 lbs. The gin made the difference.

109 Slaves were bought and sold.

409 This is not an American picture, but during the early period American women spun their yarn on just such wheels. They also wove their yarn into homespun cloth. There were no spinning or weaving mills in America.

14 Parliament made laws forbidding the exportation of machinery or of patterns for machinery. In 1790 Samuel Slater, an Englishman, reproduced Arkwright's spinning machinery from memory. In 1813, Francis Lowell and Patrick Jackson made a weaving machine in the same way. From these beginnings arose the great textile industries of the United States such as

are shown in this view. Mills work best with free labor. These manufactories in 1816 led to the first protective tariff. Later the North and South differed over tariff as in 1828. In 1832 South Carolina nullified a tariff law as the South did no manufacturing.

71, 106, 27, 217 One of the great difficulties of the age was transportation. Wagons and sailboats were the only methods of carrying. Flatboats were found on the rivers, especially the Mississippi, but they could not make a return trip.

61, 52, 26, 27, 39, 48 The invention of the steamboat in 1807 stimulated production by furnishing means of transportation to market. Steamboats on the Great Lakes, the Ohio and the Mississippi encouraged settlements along those waterways. The first steamboats were very primitive affairs.

48, 43 The Erie Canal enabled western farmers to send their produce to eastern markets at cheap rates. It made New York the largest city in the United States. Many other canals were built.

25, 26 New York, Philadelphia and others began their wonderful growth. In 1800 New York had 60,000 inhabitants and Philadelphia 70,000. In 1830 New York had 200,000 while Philadelphia's population was 167,000.

43, 129, 128 In 1828, began the building of railroads which brought every part of the country within reach of markets. The railroads were important factors in settling the west.

198, 181 The invention of improved plows, harrows, planters, cultivators, reapers and all sorts of farm machinery that could be drawn by horses enabled men to plant large fields with less labor. It vastly multiplied the working power of men on farms.

357 Though found in England, this is the type of reaper and binder first invented in America. Such machinery made slave labor unnecessary, so you see the North and South developing along different lines. The North with its factories and machinery favored free workers, nationalism and protective tariff. The South with its agricultural products raised by slaves opposed the tariff and favored states rights.

103 In the early days wood and charcoal were the only fuels used even in locomotives and steamboats. Steel was melted in charcoal furnaces.

74, 75, 76, 77, 79 The substitution of coal for charcoal was a real economic revolution which affected all the industrial life of the country. It made the modern blast furnace and the quick moving steamboat and locomotive possible.

61, 139, 152 Cities began to grow in this new western land.

ad led to the settlement of the West. Northerners
rs flocked to these fertile fields each trying to claim the
m or slavery. That brought about the Missouri Compron
loctrine of popular sovereignty, the Omnibus Bill of 1850,
ebraska Bill of 1854, the Dred Scott Case 1857, and fi
War.

This western country was the scene of many Indian v
ore it became settled. In 1876 Gen. Custer and his en
ce were massacred by Sioux Indians at the Little Bigh
er.

Game abounded everywhere.

ping was profitable.

discovery of gold and silver immediately brought seekers
alth. Little mining camps were established in mountain
s and the history of the Far West was begun.

4, 195, 197, 200, 201, 202, etc. Men explored and penetrated
parts of the country. For the first time its diversity and
ent were realized.

223, 224, 225, 226 The United States gained possession
gon and her northern boundary was settled.

Utah was settled by Mormons.

0, 121 Cities sprang up everywhere because there must
ling centers in mining, grazing or farming regions.

1. Mexican War

5 The Mexican peon or peasant has not changed much.
Alamo was used as a fort by Texans and Americans to
l themselves against the Mexicans in the war for the in
dence of Texas, in 1837. Every one of the defenders v
d. "Remember the Alamo" became the battle cry of
ican War.

Cruz, Mexico's one seaport was captured by General Sc

104, 105, 112, 117, 124, 125, 119 Such labor could be done very cheaply by slaves.
96 Washington's home is a type of the homes of the rich, slave holding Southern planter.
113 Lincoln's home was a type of the homes of the poor whites. The poor whites could not compete with slave labor.
47, 38, 137 Types of small farms in the North with free labor.
14, 15, 16, 17, 18, 19, 53, 54, 55, 58, 59, 62, 63, 64, 66, 67 Manufacturing in the North, the South had no manufacturing. This led to different ideas as to tariff, sovereignty, slavery, etc.
101 John Brown's raid persuaded the South that they could not expect justice from the North.
120 The capture of the Mississippi River divided the Southern states.
119 The capture of New Orleans by the North decided the English not to recognize the Southern Confederacy.
100 In Hampton Roads was fought the great naval battle between the Merrimac and the Monitor. These were the first ironclad war ships.
114 On Lookout Mountain the battle was fought above the clouds.
73 The Battle of Gettysburg was the turning point of the war.
106 Gen. Sherman marched from Atlanta to Savannah, then turned north and fought his way into North Carolina.
94 Great issues of paper money were put out during the Civil War.
105, 108, 115, 117, 118, 119 These views show free negroes, made free by the 13th Amendment, made citizens by the 14th and given the vote by the 15th.

B. SOCIAL AND ECONOMIC DEVELOPMENT

1846–1898

1. Eastern

The Eastern part of the country is the manufacturing center. During this period manufacturing developed as never before. Corporations were formed, these grew into trusts and the wealth of the nation began to collect in the hands of the few. On the other hand, laborers combined into unions, demands were made for shorter hours, higher pay, better working conditions. There was labor agitation everywhere and the strife between capital and labor was very bitter. The antitrust laws were passed, trusts were prosecuted, an income tax was imposed, child labor forbidden. In 1886 there were 1,572 strikes. These conditions dominated the political life of the period.

32 One of the great problems of these years was immigration.
5 Skilled Italians.
75, 77 Very much of our unskilled labor is done by foreigners.
227 Chinese and Japanese laborers have come to our shores in considerable number but are now excluded.
3, 4, 5 Stones of all kinds are being quarried.
14, to 18, 22 to 24, 53 to 55 Thousands of workers find employment in textile mills. Here always rises the subject of protective tar-

iff. The Walker, War, McKinley, Wilson and Dingley tariffs were passed to regulate tariffs.

58, 59 In New Jersey and Ohio pottery works have become an important industry asking protection.

40 Garments made in factories are taking the place of homemade articles. Laws had to be made against sweatshops.

62, 63, 64, 65, 66, 67, 82 Work in steel mills is hard and dangerous. The mills are owned by vast trusts and the men are highly organized. Steel mills grew up within reach of ore and coal. They employ vast numbers of foreigners.

74, 75, 76, 77, 79, 129 The substitution of coal for water power makes most of the industries of the United States dependent upon the coal supply. A strike of coal miners is a national calamity.

69, 70 Oil was discovered in western Pennsylvania in 1859 and has become one of the greatest sources of wealth in America. The first great trust was the Standard Oil Co.

44, 45, 46, 47, 56, 57, 85 Farming is also an important work, for farmers produce the food upon which all the people must subsist.

25, 26, 27, 28, 29, 30, 52, 61, 139, 167, 230 In places like these is carried on the business of the United States.

26, 27, 31, 43, 48, 52, 61 Perhaps the development in transportation, and exchange is the most wonderful of all. Such marvelous improvements have been made. Air brakes, couplers, electric motors and countless other things have revolutionized life and law. The electric street car makes the great city possible. Through interstate commerce laws the national government has found a way to regulate trusts.

a. Southern

Since the War the South has become marvelously prosperous. These views show the results of free labor.

112, 105, 117, 124, 125 Cotton and tobacco still furnish the chief wealth.

118 Peanuts are a profitable crop.

122, 123 Vast oil fields have been found in Texas and Oklahoma.

127 Texas also has great districts devoted to cattle raising.

111 Sponges are a source of great wealth.

104, 105 Rice is a very valuable crop.

86, 97 Almost the whole oyster supply of the United States comes from the Chesapeake Bay region.

107 The pine forests furnish vast quantities of lumber, tar, turpentine.

110 Alligator leather is valued.

116 Manufacturing is beginning as there are large deposits of both iron and coal. Some cotton mills are prospering.

106, 119 Because the South carries on a great trade, selling raw material and buying its manufactured goods, it is still a low tariff country.

85, 108 Fruit raising has become a source of vast wealth.

3. Middle Western

This part of the country has every kind of industry. Here are found the great fields where food, both animal and vegetable is produced, and there are many great cities, centers of manufacture and commerce. As grain fields, ranches, mines and cities grew, transportation became of increasing importance, Granger Laws and the Interstate Commerce Act resulted. Corporations and trusts were established and there were great contests between capital and labor.

147, 177 Millions of bushels of grain of many kinds are produced. As grain or flour it is shipped to all parts of the world. Speculators were able to buy up food and make prices high.

173, 172, 183, 185, 186 Immense numbers of animals are raised in the great Middle West.

140 These cattle are shipped to Chicago, Kansas City, Omaha, and other cities where are located the greatest meat packing establishments in the world.

141, 142, 143, 144 All this preparing and packing is done under government inspection for these packing houses furnish a large part of the meat of the nation and of Europe. Laws regulating the preparation and purity of foods came as a result of such industries. Meat trusts were formed.

175 Apples and other fruits are produced.

134, 135 Wonderful plate glass is made at Rossford, Ohio.

133 Akron, Ohio, became the center of the manufacturing of rubber goods in the United States.

155, 156, 157, 163, 164 Immense mines of copper and iron ore were discovered in Michigan and Minnesota. These were controlled by trusts.

128, 154, 157, 164 These ores greatly increased lake traffic.

63, 64, 65, 66,67, 78, 128 Wonderful labor saving machinery of all kinds was invented during this period.

174, 154, 148 Bridges, canals, dikes made transportation safer and easier.

139 Cities like Chicago with their millions of people engaged in all sorts of industries are centers of labor disputes. The strike of 1894 in the Pullman Car Co. is an example.

4. Western

In 1846 the Rocky Mountains formed the western boundary of the United States. In 1898, the country extended to the Pacific Ocean.

225 The discovery of gold caused the first rush to the Far West.

214 Little mining camps were located in the mountain valleys.

187 Soon other metals were found in great abundance.

216, 233 Gold is not the only wealth of the region. The yearly wheat crop of California is greater in value than the annual output of gold.

188, 190 Mining is not the only source of wealth. Great herds of horses, cattle and sheep are raised and agriculture is developing.

Alaska was purchased in 1867.

, 245 Gold discoveries.
Methods of travel.
Fisheries and forests are valuable.

2. Cuba

Cuba is a United States protectorate, not a possession.

, 298 Typical scenes in Cuba.
"Remember the *Maine*" became the battle cry of t
American War.

3. Porto Rico

, 258 Porto Rico was taken by the United States in 1898
1917 were Porto Ricans made United States citizens.

4. Philippine Islands

547 The Battle of Manila came May 1, 1898. After tl
were defeated the natives revolted and had to be sub
549, 550, 551 The islands are very rich in natural res
the common people are backward. The question of
pendence of the islands presented a serious problem.
553 Hemp rope is a valuable product.

5. Hawaii

he Hawaiian Islands were admitted in 1898. Previously
had been refused.

III. MODERN PERIOD

1898–1917

The last twenty-five years of the history of the United States are described as years of marvelous social and economic development. People lived securely, they were prosperous and progressive. Men's minds turned naturally toward the problems of the improvement of internal conditions. Trusts were controlled in part; labor was encouraged; new inventions have revolutionized industry. There has been a great growth in democracy marked by such issues as the initiative and referendum.

Suddenly a change came. In the period from 1910 to 1917 the greatest political changes yet known have come to the United States. By the Spanish War, the nation was forced out of her isolation into international diplomacy. Her acquisition of the Philippines brought her into relations with Japan. Still her development was largely economic and industrial. When the World War began, the United States tried to remain neutral. Gradually she was forced into the war and a new era in history has resulted. She will never be able to withdraw from world affairs into which she has entered.

280 to 341 An organized attempt is being made to cultivate friendly relations with Spanish America so that the Monroe Doctrine may develop into a Pan-American Doctrine.

247 to 256 On Nov. 18, 1901, a treaty was made with Great Britain abrogating the Clayton-Bulwer Treaty and providing that the Isthmian canal should be under the sole jurisdiction of the United States.

337, 249 In 1903, a canal treaty with Colombia was signed but the Congress of Colombia refused to ratify it. The rights of the old French Company were purchased by the United States.

248 On Nov. 3, 1903, the state of Panama revolted and seceded from Colombia. And on the 18th of November the United States and Panama made a treaty by which the United States is to have sovereignty over the Canal Zone ten. miles wide and to safeguard the independence of Panama.

250, 251 In 1904, the United States began work on canal.

250, 252 In 1906, Congress decided upon a lock canal. In 1907 it was in charge of army engineers.

247, 251, 253 The main obstacles to the completion of the canal were the Chagres River and the landslides and the pestilential climate.

250 to 253 These views give an idea of the great engineering works done under the leadership of Col. Goethals of the United States regular army. Gatun Lake is an artificial lake which takes care of the sudden floods of the Chagres River and provides a part of the waterway.

255 Major Gorgas of the medical department of the United States army has practically eradicated malaria and yellow fever from the Canal Zone. This proves that the tropics can be made healthful places where white men can live and do good work. It opens the whole tropical belt to development.

254 On August 15, 1913, the Panama Canal was formally opened. It makes it much easier for the United States to protect both her coasts. Also it shortens trade routes by thousands of miles, saving time and coal. It will especially stimulate trading between the eastern and western coasts of both North and South America and will help to promote Pan-American friendliness.

243 to 246 In 1901 a dispute between England and the United States concerning the Alaska boundary line was settled by arbitration.

520 In 1900, American troops allied with troops from Japan, Russia, Great Britain and France 18,000 strong, marched to Peking to rescue the legations besieged by Boxers.

280, 289 Since 1910, Mexico has been in an unsettled state. Rebellion has followed rebellion. Presidents Diaz, De la Barra, Madero, Huerta, Carbajal and Carranza followed each other with bewildering rapidity. American lives and property were destroyed and many Americans demanded intervention.

280 On April 21, 1913, the United States seized, and for some time held, Vera Cruz.

282, 283 In February, 1915, Villa captured Guadalajara. In March, his forces captured Mexico City.

88, 315, 305, 324, 335, 291 Ambassadors and ministers from United States, Argentina, Brazil, Chile, Bolivia, Guatemala and Uruguay met and recognized the Carranza Government.

126 After promiscuous shooting across the border and an attack on Columbia by Villa's men, American troops under General Pershing were sent to the border. The American headquarters were at San Antonio.

209 Through deserts of this kind Pershing's men followed Villa.

466 On June 28, 1914, Archduke Ferdinand and his wife were assassinated at Serajevo, Bosnia, by a Servian student.

460 to 467 On July 28, Austria declared war on Servia; then Russia began to mobilize her troops and soon the whole of Europe was involved in war.

25, 52 The United States as a neutral was engaged in carrying on trade and suffered from both sides.

242 American submarines. Because her north coast was blockaded, Germany took to submarine warfare and persisted in sinking vessels without warning, a clear violation of international law.

52 This view shows an ocean liner. On May 7, 1915, the ocean liner

Lusitania was attacked without warning and many Americans, women and children, lost their lives.

384, 526, 282 The German Imperial Government plotted to involve the United States in war with Japan and Mexico.

88, 87 On April 6, the United States Congress, acting upon information furnished by the President, declared war upon Germany.

52 In this scene, we have the *Vaterland,* the largest ship in the world, and several companion ships owned by Germany and her allies, interned at the beginning of the war (1914) and taken over by our Government, April 6, 1917.

385 Some of the trained soldiers of Germany.

394 Zeppelin flying over a German town.

426 Airplane on scout duty with French troops.

83, 137, 147, 166, 184, 177,178,179,198, 199, etc. The United States felt the necessity of feeding the allies and the nation turned toward agriculture. No plot of land was too small for a war garden.

94 Liberty Bonds, prepared in the Bureau of Printing and Engraving, were issued. $2,000,000,000 was asked for, $3,035,226,850 was subscribed. Immediately afterwards the Red Cross asked for $100,000,000 and received $114,000,000.

64 to 67 Steel workers. A selective draft bill was passed, by which men who would least cripple preparatory work at home could be selected for the army; for instance, steel workers are needed at home to make munitions. All men between 21 and 31 registered on June 5, 1917, and the draft took place July 20 following.

146 Missions from France, other allied countries visited America to plan the largest coöperation.

421, 422 Paris; 426 French army. On June 13, 1917, Gen. Pershing and the first contingent of American troops reached France and joined the allied armies. They received a wonderful welcome.

482 to 488 In the spring and summer of 1917, the Russian people overthrew the Romanoff Government. The entire country was disorganized and chaotic. A commission from the United States headed by Elihu Root visited Russia.

26 New York City; 52 Ocean liners; 106 Savannah; 119 New Orleans. An embargo on food stuffs and war materials was declared in order to prevent such materials reaching the enemy. No ship could leave an American port without a special license.

166 Potatoes; 199, 219, 233 Wheat. A food control bill was passed August 11, 1917, and Hoover was made head of a commission with power to control prices and supplies. The price of wheat was regulated.

SOCIAL AND ECONOMIC DEVELOPMENT 1898–1917

Eastern

94, 84 Never was the country so prosperous and a supply of money so needed.

75, 76, 79 The anthracite coal strike in Pennsylvania in 1902 was the first time a President had intervened in a dispute between capital

Oil; 112 Tobacco; 14, 15 Cotton; 65, 66 Steel; 129 Coal;
, 144 Meat. The Government is actively engaged contro
usts and companies of all kinds that there may be more e
istribution of wealth.
9 Acts were passed (1901, 1906, 1910) extending the po
f the Interstate Commerce Commission and further control
ilroads. It is now generally conceded that regulation and
ol of railroads are necessary and fully within the power of
overnment.
7, 18, 14, 15, 16 Modern inventions make finer and more be
ful cloths.
5 Butter and milk are important articles of food. Local g
nments are interested in cost and cleanliness.
Modern methods facilitate all work.
rket gardens are necessities and very profitable.
ldren are taught the value of the home garden. All sorts
ocational training are being taught.
n the price of eggs is of national importance.
1, 139, 220, 230 Nowhere is the modern life so complex as
e city with its problems of reform. Municipal commissi
d city managers are new devices for better city governme
en are devoting their whole lives to the solution of ci
oblems.
3, 89 In Sept., 1916, Congress passed the Adamson Bill re
ing time and wages of railroad men. This was done to p
it a railroad strike that would have brought ruin to the co
. Transportation is not a private matter since in our co
ated system the lives of millions depend upon the transpor
a of food.
Immigrants are now carefully sifted

156, 155 Minerals are produced on a scale never before known and they are reduced by modern methods.

165, 185 Modern life demands cattle raised and cared for in the cleanest, most healthful way.

136 Corn is now largely cut by machines.

177 Threshing is carried on by steam engines.

179, 178, 180 Even the horse has given way to a great extent to the tractor that never tires. All these increase the acreage that may be cultivated.

191 to 197, 228, 229, 219, 222 In the Far West mineral and forest wealth are so great and private ownership so wasteful that the United States has turned its attention earnestly to conservation. Reclamation also has been carried on by the government. National parks have been set aside to preserve forests, scenery, fish, game, etc.

215, 216, 217 The forests are melting away, so conservation came as a national policy. In May, 1908, was held at the White House a conference of State governors, congressmen and others. This resulted in a widespread interest in conservation.

199 Dry farming methods for wheat. New methods of farming are tried.

218, 233, 235, 236, 237 New machinery has made the cultivation of a vast acreage possible and scientific culture has produced bountiful results.

210 In June, 1902, Congress passed an act by which the proceeds from the sale of public lands in sixteen States goes into a special irrigation fund. Local enterprise would find it difficult to construct such stupendous works as these dams by which thousands of acres of dry land have been made productive by irrigation.

187, 203 Modern economical methods of ore reduction are in use increasing our metal production and at the same time conserving the supply.

117 In 1916 and 1917 there was a noticeable movement of negro laborers from South to North. This presents an economic problem of importance.

148 In East St. Louis, Ill., 1917, there was a terrible fight between blacks and whites and many on both sides were killed. The race question is a difficult one in the United States.

88 Congress. On Sept. 8, 1917, at 11 P. M., whiskey ceased to be manufactured and its importation was prohibited, as a war measure, through a law passed by Congress Aug. 10, 1917.

Note:— This page to be used for record of current historical events.

13. AMERICA OF TODAY — OUR RESOURCES — PREPAREDNESS

By JACQUES W. REDWAY, F.R.G.S.

GEOGRAPHER, METEREOLOGIST, UNITED STATES GOVERNMENT, MT. VERNON, N. Y.

America today is one of the most interesting countries in the world. It is well worth while to consider our resources, our development in many lines and how we compare with other nations of the world. America is the richest country in the world. Other nations have called us money mad; but all this wealth is strength. Today we are not looking at our resources so much with pride in our wealth as with patriotic joy in our strength.

The first years of the twentieth century have witnessed a great centralization of power in our national government. On the other hand people were never before so widely interested in the government or so watchful of it. These two opposing tendencies will probably check each other.

OUR WARS

10, 80 The Revolution gave us political freedom and established us as an independent nation. Our Declaration of Independence has paved the way for civil liberty in all nations.

71 The War of 1812 gave us commercial independence on the sea and throughout the world.

206 to 214, 228 to 242 The Mexican War brought an important addition to our nation, giving us several additional states in the Southwest.

73 The Civil War established economic independence and eliminated human slavery.

296, 546–554 The war with Spain made us a great world power.

88, 92 On April 6, 1917, after vainly endeavoring to avoid the step, our congress declared that a state of war existed between us and Germany.

87, 242, 426, 146, 385, 394 What will the World War do? It is undertaken to make neutrals safe forever and to make democracy possible throughout the world. It is a war for world freedom.

100, 254 A greatly enlarged navy has been provided for and is being built. In this connection it is well to remember that the ironclad battleship — the foundation of modern navies — was invented in America and the first battle between ironclad battleships occurred in American waters. At the close of the Civil War we had the only armored navy in the world.

242 The submarine was also an American invention, the first practical submarine boat being built by John Holland of Paterson, N. J.

426 The airplane — the "eyes of the army" — was invented and largely developed in America. The experiments by Prof. Langley of Washington, D. C., were followed by the triumph of the Wright brothers of Dayton, O. The airplane service has proved an important factor in the World War.

RESOURCES

The United States is the greatest agricultural country in the world. Extending over so wide a range of country with such varied climate and surface, its products are diversified. The Mississippi Valley alone contains nearly a million square miles almost all of which is suited to the uses of man. There is no other land of its size on the surface of the earth so admirably suited to the purpose of mankind. President Wilson's appeal to the farmers and gardeners of America resulted in an increase of one million bushels of foods being grown in 1917. "War is no longer a collision between two armed forces; war is a contest of economic resources. The man at the forge or the man with the hoe is as much a soldier as the man with the sword."

83, 115, 161, 178, 180, 179 All living things require food, plants as well as animals. Plants take their food out of the ground, and the first principle of farming is learning to put back into the soil what the plant takes out of it. This is called "fertilizing the soil." Plant crops take from the soil nitrogen, lime, potash, and phosphoric acid and all these must be returned. In the large farms of the United States all this is done by machinery. Draining, ditching, plowing, fertilizing, harrowing and planting are done on a scale that was not dreamed of a century ago and which few countries attempt to duplicate even now. The foundation of this country's strength is its food supply. President Wilson has said "upon the farmers of this country rests the fate of the war."

Wheat

177, 199, 218, 233, 357, 488 In 1915 the wheat crop of the United States exceeded 1,000,000,000 bushels while the whole world produced 3,750,000,000 bushels. Very nearly 600,000,000 bushels are needed for home consumption. For the five years from 1910 to 1915, of the total world's crop, the United States produced an average of 19%; European Russia 17%; India 9%; France 8%; Austria-Hungary 6%; Canada 5%.

Oats

147. There is not much commerce in oats, the crop is consumed as fodder where it grows. In 1900 the United States raised 809,000,000 bushels of oats; in 1914, 1,153,000,000.

Indian Corn

184, 136, 137, 184. The American maize or Indian corn crop of the United States has reached 3,000,000,000 bushels. Not much is exported but the demand abroad is steadily increasing. In normal times the value of corn in the grain rarely exceeds half a cent a pound. Converted into meal it is worth five or six times as much. Corn products include spiritous liquor, glucose, confectioner's sugar, oil and smokeless powder. The United States produces 71% of the world's crop; Austria-Hungary 6%; Mexico 5%; Argentina 4½%; Roumania 2½%; Italy 2½%.

Rice

104, 105 The rice crop of the United States is small and does not meet the demand therefor; indeed, if the world's crop were doubled, it would find consumers. Ordinarily, rice commands about the same price as wheat — pound for pound it is more nutritious. India raises 45% of the world's rice; China 22%; Japan 12%; and the United States less than 1%.

Cattle

127, 186, 185, 188, 140, 141 The cattle product of the United States formerly allowed a very large export to western Europe; now, the export is comparatively light — about 50,000,000 pounds in 1916. The production is likewise decreasing. This is due in part to the decreased acreage of grazing land, but quite as much to speculative methods of handling the meat business. Twenty-five percent. of the world's cattle are raised in India; 13% in the United States; 8% in European Russia; 7% in Argentina; 6% in Brazil; 5% in Germany; 3% in France; 3% in Great Britain.

The Hog Industry

172, 183, 143, 144 There are two reasons for the great commerce in pork; it contains a greater amount of fat, one of the essentials of food, than any other merchantable meat; it is more easily preserved than any other. As a result, the preserved meat finds as great a demand in tropical countries, where fresh meat spoils in a few hours, as in cold regions. The United States produces the most hogs.

Mutton

173, 145 Because of its tenderness and rich, meaty flavor, mutton is a favorite with the gourmet and epicure. In thickly peopled regions of the cold temperate zone, the sheep is grown for meat; elsewhere, for its fleece. English mutton and Canada mut-

ton are largely a product of climate. In the same way, the merino sheep is a product of arid climate.

Dairy Industry

45, 46, 159. 165, 57 The milk supply of a large city must be delivered daily, and, in most large cities, the production is supervised under rigorous measures, in order to insure purity and cleanliness. Milk is consumed near by; but little is transported more than one hundred miles. That which is to be kept more than sixty hours is "condensed." Butter may be kept in cold storage for several months. American cheese is now a matter of export. About 300,000,000 pounds are produced of which as many as 100,000,000 pounds have been exported in a single year.

Poultry Industry

56 The yearly value of the poultry industry is about as great as that of the wheat product. Most of the commerce of the industry centers about the large cities. The demand for "squab" or young chickens is so great that the prices of eggs have advanced materially. Eggs from China recently have become a steady import.

Fisheries

13, 86, 97, 226, 227 Cod off the Atlantic coast and salmon during the spring run in the rivers and estuaries of the Pacific coast form the most important catch. The cod is salted and suncured; the salmon is cooked and canned. Both are articles of export. Any sort of small fry, especially herring, in a can with a French label is "sardine" and Russian caviar is the roe of American sturgeon. Much of the cod export has gone to the West Indies since the early days of the Massachusetts settlements. The oyster may be classed among the luxuries, but the demand therefor is growing with leaps and bounds. The oyster beds of the northeast coast of the United States, where the bivalve is cultivated, are the largest in the world. The fishery products of the United States exceed those of any other country. In 1915 they were valued at almost $70,000,000; Japan was next with $63,000,000; England and Russia each had $50,000,000; France and Canada each $333,000,000; Scotland $19,000,000; Ireland 1,000,000 and Germany $10,000,000.

The Sugar Industry

34, 35, 258 Of the cane sugar, India produces 26%, Cuba, 23%, Java 15% and the United States with her dependencies 12%. Of the beet sugar Germany makes 30%, Russia 21%, Austria 20%, France 9% and Belgium 3%.

Iron and Steel

The United States leads the world in the manufacture of iron and steel. Her annual production of iron ore is about 62,000,000 long tons.

Just before the World War, the United States produced about 41% of the world's pig iron, Germany 24%, Great Britain 12%, France 7%, Russia 6%, Austria-Hungary 3%, Belgium 3%.

61 Half a century ago Pittsburgh was an ideal location for iron mills for the ore and coal were almost within a stone's throw of each other and the three rivers offered transportation at a very low cost. Even though most of the iron ore now comes from the region of the Great Lakes, Pittsburgh's nearness to the coal and coke supply makes its location important — it is the greatest iron and steel center in the world.

163, 164, 154, 128 With facilities for transportation such as are shown in these stereographs, a ton of iron ore can be mined and loaded at the Lake Superior mines and transported to the smeltery nearly a thousand miles away for less than four dollars.

116 The Southern Appalachian ore fields are scarcely touched. This ore is especially adapted to the making of steel rails. Those made by the open-hearth process usually command a higher price than those made by the Bessemer process.

62, 63, 64, 65, 66, 67 Pulling a lever starts the ponderous machinery that operates the various processes. The huge machines seem to have almost human intelligence. Brains take the place of brawn, and one man exerts a power that is rated by the thousands of horse power.

103, 68 No fuel, or reducing agent, equals charcoal in the smelting of iron ore. The charcoal burns the oxygen out of the ore, leaving free, molten iron. Charcoal, however, is limited in quantity and is expensive; so the wits of man were called upon to make an artificial charcoal — the substance commonly called coke. Fat coal is dumped into "ovens" and heated to whiteness. Thereby, the liquid and gaseous chemical constituents are driven off. One of the by-products of the coke oven is coal tar from which nearly one thousand substances of commercial value — dyes, drugs and explosives — are made. Coke ovens are constructed on the side of a hill, if possible, so that the coal may be dumped into the oven from a railway at the top and the coke shovelled into cars running on a track below the ovens. In 1913 more than 46,000,000 tons of coke were used in the United States.

Copper

155, 156, 157, 187 In its importance to humanity, copper ranks next to iron. In 1913 the world's production of copper was 2,198,732,130 lbs. of which the United States produced 56%, Japan 7%, Chile, Peru and Bolivia together 7%, Spain and Portugal 6%, Mexico 5%, Canada 3½% and Germany 2½%. The demand for copper is far greater than the supply. Most of the output is used as a conductor of electricity; a great deal is used in cartridges. It is the chief ingredient in brass and bronze.

. Gold and Silver

203, 246, 287, 214 Gold and silver have been standards (hange ever since history began. Gold is generally found lver, in combination. In 1912, the world's output of gol alued at more than $466,000,000. Of this Africa supplied 5%, the United States 20%, Australia 5%, Mexico 5%, F %, Canada 3% and India 3%. Of the world's producti 147,900,000 of silver, Mexico provided about 32%, the U tates 20%, Canada 13%, Germany 6% and Peru 4%.

Coal

5, 76, 77, 129, 79 The coal fields of the United States are xtensive and also the most productive in the world anc esults in the tremendous output of iron and steel and the anufactures, the most productive in the world. Of the w nnual production of $1,443,000,000 short tons, the United S oduces 39½%, Great Britain 22%, Germany 20%, Au ungary 4%, France 3% and Russia 2%. Pennsylvania ces nearly all the anthracite of the world.

Petroleum

) The ordinary substance known as petroleum or coal oi world-wide commerce. The United States produces 65 e world's supply; Russia 16%, Mexico, 7%, Roumania utch East Indies 3%, Austria-Hungary 2%, India 2%. oline and petrol are the most important factors in the distill crude oil. These are used for running engines. The eam engine rarely utilizes more than one-fifth of the he wer which the steam-making fuel contains. The internal

of Niagara Falls makes possible certain products essential to modern industries. Chief among these is carborundum. It is the basis of most of our grinding machinery in our great automobile factories, munition plants and machine shops. Niagara Falls gives us our aluminum supply. It gives us also products which added to steel give it a hardness that makes it wonderfully resistant — so hard that when used on the point of a modern shell, it will pierce the armor plate without being deformed itself. The water that runs over the spillways at Keokuk, Iowa, and at Roosevelt Dam near Phoenix, Arizona, is not wasted; its power is turned into electricity.

Lumber

The proportion of lumber used for building as compared with stone cement and brick is decreasing. Nevertheless the present rate of cutting is three times the annual growth. The timber covered area in the United States is estimated at 500,000,000 acres or about one-fourth of the country. The Southern Pacific and Northern Pacific railroad companies together with several lumber companies own about four-fifths of this; the rest belongs to the nation or to states. The United States, Canada, Sweden, Norway, Russia and Austria export lumber. All the others import it.

1, 162, 215 These pictures demonstrate each the solution of a problem: namely, how to get the logs to the mill in the most inexpensive way. In each case, it is solved for the particular locality.

216, 217 The lumber mills of Puget Sound and vicinity supply not only the lumber requirements of the Pacific coast but also a large demand in China and Japan. Both of these countries have been greatly denuded of forest trees, much to their detriment. Transcontinental railways depend largely upon the Puget Sound mills for their heavy timber, especially long pieces, such as are shown in stereograph 217. See also stereographs 224 and 229.

130 The maple furnishes not only sugar; the lumber ranks among the most valuable cabinet woods in the country.

Marble

4, 5 Marble for architectural ornamental work is world-wide in use, and for carved work is probably more extensively used than any other stone. Fine-grained white marble free from blemishes commands very high prices.

Granite

3 Probably most of the granite now quarried is used in the construction of government and other large office buildings, being cut into ornamental blocks at the quarries. Thus prepared it is often shipped long distances. In the rough, it is no longer an article of commerce to any great extent, concrete being a cheaper and equally durable substitute. The quarries of the White

Mountain region furnish most of the granite in the eastern states. Red and dark gray granites are abundant in the western Highlands.

Structural Steel

25, 26, 31, 174, 253 A building of brick or of stone reaches the limit of height with the sixth or seventh story. With a frame work of structural steel girders and beams, the height may be readily carried fifty stories, or 500 feet. The buildings in 25 and 26, the railway viaduct in 31, the bridge in 174, and about everything but water and shore line in 253 show the engineering possibilities with steel as a building material and the impossibilities of modern commerce without it. America excels all other nations in its manufacture and use of structural steel.

Lime

97 Shells of oysters and other mollusks are used also in surfacing roads and in making lime of a very superior quality. Most of the lime is made by burning limestone in a kiln.

Concrete

210, 252 "Portland" cement is now made artificially by burning limestone and clay in much the same manner as in lime-making. Mixed to a still mortar with water it hardens — becoming so hard indeed that it turns the edge of a steel drill. The cement, mixed with sand and broken rock is the "concrete" of engineering science. Concrete has almost wholly superseded rock in the construction of viaducts, dams, and bridge approaches. The Panama Canal locks and the masonry of the various irrigation projects are built of concrete. In 1900, the United States made 8,500,000 barrels of Portland cement; England between 7,000,000 and 8,000,000; France 3,000,000; and Germany 30,000,000.

Glass

134 A fine white sand is the first requisite in the manufacture of glass; other ingredients are lime and sulphate of soda. These are melted into a transparent fluid mass by means of gas blasts. In the United States most of the glass-making establishments are located in places where natural gas is abundant.

The Cotton Industry

117, 119, 124, 125 The United States produces more than five billion pounds of cotton yearly. About one-third of the crop is made into cloth in the mills of the United States. Raw cotton is exported to nearly every country in Europe and American cotton cloth is used by practically every people on the face of the earth. The United States raises about 62% of the cotton, India 18% Egypt 7%, and China 6%. England is the greatest manufacturer of cotton cloth. In 1914, England had in operation 56,900,000

spindles, the countries on the continent had 43,200,000, while the United States had 31,840,000.

The Wool Industry

The scoured wool produced in the United States averages 136,500,000 lbs. a year and yet there is practically none for export. In addition to this the United States imports 8% of the world's supply. France imports 25%, Great Britain 22% and Germany 20%. Australia is the greatest wool growing country, producing 30% of the wool, and Argentina is next, with 15%.

Naval Stores

107 The southern pine yields turpentine, pitch, and wood tar. Formerly in the days of sailing vessels, the two last named were used in calking the seams and joints of sailing vessels, and in preserving the fixed parts of the rigging. Therefore, they were called "naval stores." Nine-tenths of the world's supply came from the United States. Turpentine is the solvent for the oils used in mixing paint.

The Tobacco Industry

112 The United States is probably the foremost country in the value of its tobacco crop. One item of the industry is the manufacture of snuff. The world's supply of this material is made in the United States. The redeeming feature of the tobacco industry is the revenue to the United States Treasury that comes from the various taxes imposed on it.

Educating a Nation

83, 260 Education is the foundation of a nation. Since each citizen of a democracy has a share in the government, every citizen should be educated. United States in 1915 had 7.7% of illiterate people, England had 1% and the German Empire only 1/50%.

The Material Foundation

19, 20 Print paper is an essential of public education. The circulation of some of the daily papers reaches about half a million a day; and the strip of paper on which the daily issue of the *New York Times* is printed would reach from New York to Denver. One great magazine, founded by Benjamin Franklin, issues more than 2,000,000 copies weekly. The yearly edition of a popular textbook in geography would make a stack twice as high as Mount Everest.

Transportation

71, 186, 298, 138 Our forefathers employed the ox team, the saddle horse and the prairie "schooner" to transport themselves and their belongings to the west.

legislating for railroads in such ways as the Adamso
1916, the Interstate Commerce laws and so on. Tl
States in 1912 had 241,199 miles of railway all und
ownership while Germany had 37,995 miles, 34,623 owr
state. Austria-Hungary owned 22,046 of its 27,570 m
sia in Europe owned 21,659 of its 37,008 miles; Fran
5,510 miles in 30,685 and England's 23,350 miles were
vate ownership.

00, 48, 154 Because of Bessemer steel, twin screws and
triple expansion engines the Atlantic Ocean is now
wide instead of five weeks. At the beginning of the w
the United States found her foreign commerce almos
because the English ships, the carriers of the world, w
drawn from the trade. The United States realized
must own her own merchant marine. It was throug
upon her shipping that the United States was finally d
the war.

On April 6, 1917, these and other interned German warsh
number of 91 with a total capacity about 629,000 tons w
over by the United States. Three days later 14 Au
terned ships were seized. This gave a total of 105
ships for carrying supplies and troops to our allies.
the drain of the German submarines on the world's shi
have undertaken a tremendous building program for
and wooden ships.

Some Trade Routes of the United States

y routes over which the commodities of commerce can b
rkets are quite as necessary as the market centers and po
. Some of the great trade routes, like the Panama Cana

Lake Superior is 601 feet above mean sea level; that of Lakes Huron and Michigan 581 feet. The rapids in St. Mary's River were an obstacle to inter-lake traffic. The completion of the canal locks in the river opened a route over which more freight is carried than on any other canal in the world. Two canals, one on the Canadian, the other on the American Side, connect the lakes, the American Canal has two locks. Navigation of canals and locks is free. Ore from the Lake Superior iron and copper mines constitutes a large proportion of the freight.

61, 119, 120 At the close of the last French and Indian War the acquisition of Fort Duquesne where Pittsburgh now stands, gave to the American colonies an open trade route to the mouth of the Mississippi River. Owing to the system of jetties which, by constricting the width causes the river to scour its channel to a greater depth, the river below New Orleans is now deep enough to be safe for ocean steamships.

119, 120, 148, 170, 171, 174 The Mississippi River drains wholly or in part twenty-eight states. The trunk and tributaries afford about fifteen thousand miles of navigation. Up to the time of the Civil War the Mississippi was the chief means of communication in the Central United States, the traffic between Buffalo and Chicago excepted. After the Civil War, the tremendous growth of the railways took away the greater part of its traffic. Within the first decade of the 20th century there has been a considerable increase of river navigation.

148 The amount of sediment brought down by the Missouri and its tributaries is more than the Mississippi can carry away. It is gradually building its bed higher each year. In order to offset this, it has been the custom to make artificial banks or "levees" to keep the river between banks during high water. All this has tended to make the navigable channel narrower, thereby impairing the value of the river as a traffic route. The problems of the control of the river are in the hands of the Mississippi River Commission.

248 to 256 The first proposition for a canal across the Isthmus of Panama was presented to the Spanish Government shortly after Balboa crossed the isthmus. In 1903 the state of Panama entered into a treaty with the United States, permitting the construction of the canal and granting sovereignty over a strip of land five miles on each side, officially named Canal Zone. The construction of the canal was regarded as a military rather than a commercial project. Its construction shortens the route from New York to San Francisco by 9,500 miles and to China and Japan by nearly 8,000 miles. The ports of Chile and Peru become near neighbors of New Orleans.

Note: — Since history deals so largely with economic questions, the teacher will be pleased with the wealth of economic material contained in this "600 set." Where a more extended treatment is desired, the Keystone View Company's General Catalog listing thousands of stereographs and slides should be consulted. It is especially complete in the presentation of our great industries. This catalog is free and will be sent upon application.

THE PUBLISHERS.

14. GOVERNMENT

By ARTHUR NORMAN HOLCOMBE, Ph.D.

ASSISTANT PROFESSOR OF GOVERNMENT IN HARVARD UNIVERSITY

Every one of the views in the "600 Set" illustrates some aspect of government. Every person shown in these views is the citizen or subject of some state. Every place is subject to the jurisdiction of some state. Everything is subject in some way to the operations of government. The student can profitably exercise his ingenuity in discovering in those views which seem most remote from government the evidences of governmental activity. Agriculture is often greatly aided by governmental assistance. This may be accomplished either directly by governmental irrigation works or agricultural experiment stations and colleges, or indirectly by bounties or protective tariffs. Similar relations often obtain between government and industry. Moreover, factories and mills and the machinery of industry in general are subject to governmental regulations designed to protect the health of employees and may be inspected by governmental officials to make sure that they are safe and wholesome. Highways are built and kept in order by governments of some sort and all the instruments of commerce are regulated or operated by some public authority. Certain of the views, however, suggest the existence and activity of government much more directly than the others, and are selected for special consideration under this head.

Compare the following views of different kinds. 38, 118, 147, 180, 181, 184, 186, 198, 199 Country views. 6, 7, 30, 31, 93, 139, 152, 167 Villages and cities. Notice the number of people and their activities in each picture. In villages there is greater need for community enterprise than in the country. In cities such needs are still greater.

ıı Hall and Quincy Market, Boston, Mass. Boston tc
tings were formerly held in Faneuil Hall. A New Engl
n meeting is purely democratic. In most other parts of
ıtry, local government is representative. The market
paratively unimportant as a communal enterprise. Comp
ı Quincy Market these markets in foreign cities; 387, 3
423, 555, 572.
ington's Home, Virginia; 104, 105, Rice fields, South Ca
; 112 Kentucky. In Virginia and other southern sta
ɔle settled on large plantations and lived far apart,
ıty government with the courthouse as the center natura
eloped.
New York; 68 to 71, 75 Pennsylvania. In New York a
nsylvania between New England and Virginia a mixtı
:ounty and township governments grew up and this plan
ɔwed in the majority of states.
136, 137 Indiana; 147 Illinois. Ohio, Indiana and Illin
ırally followed New York and Pennsylvania in their meth
ɔrganizing.
Dakota; 178, 179 South Dakota; 181 Nebraska; 184 to 1
sas.
Colorado; 210 Arizona; 218 Washington; 233 Californ
Far West where people have large farms and live far fr
other finds county government best suited to its needs.

b. Incorporated Villages and Cities

York City; 167 Minneapolis; 121 Oklahoma; 139 Chica
ty receives its charter from the state. As a city grows,
s grow. Therefore the government in the cities is
complex than in the towns and in the

cities and towns find that the continual use of streets necessitates their paving.

6 Boston. City streets must be lighted and good water provided.

7, Boston; 30 New York. There must be traffic laws in cities to prevent blockading the streets and building regulations to insure safety and to prevent fires.

31 Transportation, New York. City governments grant franchises to street car and other transportation companies.

95 The Congressional Library is especially for members of Congress. Each city needs a library.

28 New York. The old City Hall was too small and a larger one had to be built. Most cities own their own city halls in which are the offices of the city officers and the city business is transacted.

II. STATE GOVERNMENTS

8 The State House or Capitol as it is called, in most states, is the seat of the state government. There is scarcely a view of agriculture, industry or commerce in the United States in which there is no suggestion of action by state government. The teacher might well encourage the pupils to study the views listed under the heads of Agriculture, Production and Manufacturing, Transportation, and Commerce for the suggestions they contain of state governmental activity. The views which most directly illustrate state government are the following: —

172, 173 Agricultural Experiment Station and State Agricultural College, Ames, Iowa.

18 Woolen mill; 41 Shoe factory; 67 Steel mill, etc. Industrial views showing machinery equipped with safety devices.

14, 16 Cotton factory; 40 Collar factory; 133 Rubber works. Workrooms built in accordance with factory laws and subject to inspection by state officials.

43, 48 New York. Means of transportation, owned or regulated by the state government. The steam railroads are subject to regulation by the national as well as by the state governments. Agriculture and industry of course are also subject to the action of national as well as state governments. Indeed the joint operation of state and national agencies is one of the striking features of our government.

152 The Ford Motor Company factory and other great corporations receive their charters from the state. Also each automobile must carry a tag to show that it has a state license or permission.

44 Spraying of trees to destroy parasites and diseases has become so important that very many states send out men whose duty it is to show exactly how spraying or other agricultural work should be done.

29 Wall Street, New York. Banks are examined by the state in order that the people's money may be secure.

a. The American Federal System

Washington. The study of the national government is by the general view of the national capital. It is the District of Columbia or "federal district" whi special sense the property of the nation.

City of Mexico; 421 Paris; 435 Madrid; 450 Rome; 47 526 Tokyo. The appearance of Washington should pared with that of other national capitals. This c should be made the occasion for a general explanati different types of government, monarchic, aristocrat lican, democratic, centralized and federal.

113. These early homes of our two greatest Presidents illustrate the democracy of American government.

b. The Division of Powers

The principal government buildings: The White Hou ury Building, and Capitol, viewed from State, War Building.

closer view of the principal government buildings leads consideration of the three main branches of government, e, executive and judicial.

1. Legislative

The Capitol, Washington, D. C. The legislative or la power of the United States belongs to Congress. Th of Congress are enumerated in the Constitution and they are limited to those mentioned.

The Senate and House of Representatives in joint sessi Representative Chamber listening to an address by t

were established by the authority of Congress, for Congress may coin money and emit bills of credit. Also it may punish counterfeiters.

26, 52, 106 Congress regulates the foreign commerce.

25 New York; 106 Savannah; 119 New Orleans. It is forbidden to make any law favoring the ports of one state more than the ports of another.

48, 129, 154 It also regulates the interstate commerce.

385, 426 French and German armies. Congress may organize and maintain an army; but no appropriation for army purposes shall be for longer than two years.

100, 242, 254 American warships and submarines. Congress may build and maintain a navy.

243 to 261, 546 to 554 Congress has complete control over the territories and dependencies of the United States.

90 Congress has entire control of the city of Washington.

283 Mexico; 296 Wreck of the *Maine;* 385 German troops. Congress has the sole right to declare war. It was Congress who declared war upon Mexico in 1845, on Spain in 1898, and in 1917 Congress declared war upon Germany.

247 to 256 Panama. A treaty with a foreign country must be ratified by the Senate by a two-thirds vote. Thus the Senate ratified the treaties with Panama which gave control of the Canal Zone.

89 Supreme Court; 92 Cabinet room; 25 Port of New York; 32 Ellis Island. All appointments made by the President must be ratified by the Senate. Such appointments include judges of the Supreme Court, Cabinet members, collectors for ports, immigration commissioner and many others.

2. *Judicial*

89 The Supreme Court room, The Capitol.

The judicial branch of the national government is crowned by the Supreme Court, which meets in the room at the Capitol, once occupied by the Senate. The teacher should explain the special political powers of our Supreme Court and its peculiar importance in our system of government.

3. *Executive*

91 The Executive Mansion or White House.

The executive branch of the national government is under the direction of a single supreme magistrate, the President, whose chief duty is to see that the laws are executed.

283 Mexico; 315 Argentina; 367 Scotland; 384 Berlin; 432 Monaco; 436 Spain; 476 Greece; 483 Russia. The White House should be compared with the executive mansions or palaces of other countries. This comparison may be utilized for the purpose of showing the difference in the powers and authority of the chief executives of different countries.

146 French War commission; 100 American fleet; 247 to 256 Panama

Canal. The President is commander-in-chief of the army and navy. Panama Canal is an example of one kind of army work as it was planned and its building was supervised by army engineers. It is also guarded by army men.

88 President Wilson reading message. From time to time the President must present to Congress a message in which he tells the condition of the country and what legislation he thinks is needed.

92 Cabinet room, executive annex to White House. The President's principal advisers are the heads of the ten great administrative departments, known collectively as the Cabinet. They meet with the president once or twice a week in the Cabinet room. The distribution of power between the President and his advisers is different from that between the chief executive and his constitutional advisers in many foreign countries.

417 The Council room in the royal palace at Stockholm, Sweden, suggests an interesting contrast.

c. The Work of the National Government

Most of the work of the national government is apportioned among the ten departments and is carried on under the supervision of the members of the President's Cabinet. The departments are: (1) The Department of State, (2) The Treasury Department, (3) The War Department, (4) The Department of Justice, (5) The Postoffice Department, (6) The Navy Department, (7) The Department of the Interior, (8) The Department of Agriculture, (9) The Department of Commerce, and (10) The Department of Labor.

1. *The State Department*

296 When the battleship *Maine* was sunk in Havana Harbor, the American and Spanish governments dealt with each other through the State Department. The State Department is really our department of foreign affairs.

13, 278 Fishing — suggesting the work of the State Department in Newfoundland fisheries dispute. How does the U. S. claim fishing rights around Newfoundland?

32 Ellis Island. Questions of immigration bring questions for the State Department.

227 Especially the immigration of Chinese and Japanese has been difficult to handle. What was the difficulty?

345 Sealing in Alaska has given difficulty to our State Department.

50 Niagara. International bridges, such as the one at Niagara, are arranged for through the State Department. At Niagara Falls the amount of water that each nation may use for power is determined by international agreement.

247 to 256 The State Department handles negotiations when new territory is acquired.

338 La Guaira, Venezuela. When a European nation gets into difficulty with an American nation, our State Department guards

American interests as determined by the Monroe Doctrine. What was the Venezuela affair?

577, 578 American hunter in Africa. When American citizens go abroad, the State Department issues passports stating such citizenship. There has been much trouble with Russia over her refusing to recognize passports of American Hebrews.

558 to 569 Egypt is governed by Great Britain under an agreement among the state departments of the leading European nations.

146 French War commissioners at Lincoln's tomb. The State Department attends to arrangements for entertaining representatives from other countries.

352 London; 384 Berlin; 421 Paris; 450 Rome; 463 Vienna; 482 Petrograd. The State Department maintains ambassadors at the leading capitals and consular representatives in all important cities throughout the world.

383 to 394 Germany. When a war is declared by Congress, the State Department makes the announcement and states the reason.

52 Interned German steamships — presenting serious problems for State Department.

2. *The Treasury Department*

29 United States Sub-Treasury, Wall Street. The Treasury Department receives and pays out all the money of the United States. In order to do this, there is a treasury in Washington and sub-treasuries in various large cities.

84 The Government Mint, Philadelphia, Pa. The Treasury Department has charge of coining money, according to rules made by Congress.

94 The Bureau of Engraving and Printing. The Treasury Department has charge of the engraving of paper money, bonds, postage and revenue stamps and all such things issued by the government.

90 The Secretary of the Treasury controls the construction and maintenance of public buildings.

99 The Life Saving Service is under the Treasury Department.

347 Customs House, Liverpool; 420 Goteborg, Sweden; 433 Custom House, Barcelona, Spain. These suggest operations of the Treasury Department of other governments. All the customs houses of the United States are under the care of the Treasury Department.

3. *The War Department*

266 Highlanders; 385 German soldiers. The Secretary of War has control under the President of the military establishment of the United States. He buys uniforms, food, munitions and all sorts of supplies and keeps the army in readiness to meet that of any other nation.

25 New York Harbor; 256 Entrance to Panama Canal; 100 Hampton Roads. The War Department fortifies and guards the ports of

the United States, the Panama Canal and all places of strategic importance.

39 West Point. The War Department has charge of West Point where officers are trained for the United States army.

250 to 256 Panama Canal. Fighting is not the only work of the United States Army. The Panama Canal was planned and its building was supervised by the army engineers under Major-General Goethals.

255 Hospital at Ancon, Panama. Army surgeons and medical men under Major-General Gorgas exterminated yellow fever and bubonic plague in the Canal Zone and reduced malaria and typhoid by fifty per cent.

210 Roosevelt Dam, Arizona. The engineering work of the reclamation service of the United States is done by the army engineers.

257, 258, 546 to 553 Porto Rico and the Philippines. The Secretary of War directs the Bureau of Insular Affairs which supervises the civil government of Porto Rico and the Philippines.

394 Zeppelin; 426 Airplane. The War Department must keep up to date in everything that pertains to war. These machines used in war for the first time, have proved very destructive in the European War. The United States is building many airplanes.

266 Fifth Royal Highlanders of Montreal; 426 French troops; 585 Australian troops and American marines; 385 German troops. The American army joined the entente allies in fighting the Germans.

4. *The Department of Justice*

89 The Supreme Court room. Here the Attorney-General and other representatives of the Department of Justice argue their most important cases.

5. *The Post-office Department*

43 The mail cars on this train are under the supervision of the Postmaster-general, who has charge of everything connected with the postal system of the United States. The "postal savings banks" are under his care.

6. *The Navy Department*

100 Battleships in Hampton Roads, Va. The Navy Department constructs, mans, equips and operates all vessels of war.

254 *U. S. S. Missouri* in Panama Canal. The Panama Canal doubles the defensive power of the United States navy as ships can now move quickly from one coast to the other.

242 Submarines, torpedo boats and battleships. Like the army, the navy must have the newest, most effective ships and appliances known. Germany's "ruthless submarine warfare" was the cause of the entrance of the United States into the World War.

585 Grand Review at Sydney, N. S. W., in honor of the visit of the American fleet. In 1908 the United States fleet made a trip around the world, stopping along the way for friendly visits.

554 Guam and other small islands are governed by the naval officer who is sent there by the Secretary of the Navy.

7. *The Department of the Interior*

245 Public lands of Alaska. The Department of the Interior through the General Land Office, controls the nation's public land.

182, 204 Indians who live in tribal relations are under the protection of the Bureau of Indian Affairs. By act of Congress, reservations have been divided among the Indians living upon them, who then become taxpayers and citizens of the United States. No naturalization is necessary.

191 to 197 Yellowstone Park; 201, 207, 208 Grand Canyon, Col.; 219 Ranier National Park; 228, 229 Yosemite Valley. National parks and monuments are under the control of the National Park service.

12, 14, 16, 18, 63 to 67, etc. Machinery protected by patents issued by the Patent Office of the Department of the Interior.

172, 173 State Agricultural College assisted by funds administered through the Department of Education.

210 Roosevelt Dam, Arizona. The Secretary of the Interior has the direction of the reclamation service of the United States. This dam should be compared with the great dam at Assuan, Egypt, 569.

76 Coal mine; 208, 207 Canyon; 231 Earthquake fissure. The Geological Survey is an important part of the work of the Department of the Interior.

74 to 79 Coal mine, Pennsylvania.; 155 Copper mine, Michigan. The Bureau of Mining under the Department of the Interior works for the improvement of methods of mining and for the safety of miners.

The only important activity of the Department of the Interior not represented by any view is that of the Pension Office.

8. *The Department of Agriculture*

93 Here we see the grounds of this Department. It supervises experiments in agriculture and issues bulletins giving helpful information along these lines to the nation. The work is divided into many bureaus.

138 Percheron horses; 159 Cattle; 172 Hogs; 173 Sheep, etc. The Bureau of Animal Industry encourages the raising of the best animals.

140 to 144 Stockyards and packing houses are under the Bureau of Chemistry which enforces the Pure Food and Drugs Act.

175, 198, 211, 108, 83 The Bureau of Plant Industry studies plants, their cultivation, diseases, parasites and introduces new and valuable plants.

9. *The Department of Commerce*

The work of this department is divided among the Bureaus of Foreign and Domestic Commerce, the Bureau of Lighthouses, the

Steamboat Inspection Service, the Census Office, Coast and Geodetic Survey, Bureau of Fisheries, of Navigation and of Standards.

25, 26, 27, 31, 39, 43, 48, 61, 79, 119, 139, 154, 157, 164, 174, 215. These will give some idea of the scope of work of the Bureau of Foreign and Domestic Commerce.

13 Codfish, Massachusetts; 226, 227 Salmon fisheries. This is the material upon which the Bureau of Fisheries works.

26, 164, 154 Every view of dock or harbor or ship will illustrate some phase of the Bureaus of Navigation and Steamboat Inspection.

353 Greenwich is in England; still this regulator of the world's clocks suggests the work of the Bureau of Standards.

10. *The Department of Labor*

The Department of Labor was established in 1913.

11 to 20, etc. These and innumerable other views will illustrate the work of the Bureau of Labor Statistics, which collects and publishes information on all subjects connected with labor.

62 to 67 Steel workers. It especially studies the relation of capital, (29) Wall Street, to labor.

152 Automobile employees. It investigates hours and wages.

82 Locomotive workers; 128 Dock laborers; 132, 133 Rubber industry. It tries to discover means of advancing the interests of laboring men.

74 to 79 Miners. The Department of Labor tries to adjust labor disputes such as the one which caused the coal miners' strike in 1903.

32 Ellis Island. It has charge of the Bureau of Immigration.

83, 204, 187, 236, 249 Also it includes a Children's Bureau which is to work for the welfare of children, especially trying to abolish child labor.

11. *Other Activities*

95 The Congressional Library, for the benefit of Congress and the nation, is not under the direction of any cabinet officer.

43, 48, 129, 154, 157 The Interstate Commerce Commission regulates commerce between the states. It may even fix rates.

29 Wall Street, New York, is the seat of some of our greatest banking houses. The Federal Reserve Board was created to unite banks and make money move more easily from the great financial centers to places where it is needed.

282, 283 Mexico City; 305 Rio de Janeiro; 315 Buenos Aires; 340 Caracas. The Pan American Union has for its purpose the cultivation of friendliness and coöperation among all the countries of both North and South America.

Since the entrance of the United States into the World War, the Congress has passed several acts giving the National Executive powers unheard of before.

The selective draft was used to obtain soldiers for the army. This

takes men of a specified age, who are able to be taken without crippling industries upon which the war will depend.

The President declared an embargo upon a list of goods, in order to control their trade and prevent their reaching the enemy.

A Food Commission was provided Aug. 11, 1917, which shall control the entire food supply of the nation. The use of grain for the manufacture of distilled liquors is forbidden and the making of beer and wine can be controlled.

All these are innovations in American government. Whether they lead to permanent changes, is a matter of great public interest.

d. Government of Territories

243 to 246 Alaska is a territory under the control of Congress. It has wealth in minerals, forests, fish and fur. Territorial government should be explained.

260 Hawaii is a territory and its people are United States citizens.

e. Government of Dependencies

257, 258 Porto Ricans are now citizens of the United States. They are largely self-governing.

546 to 553 The Philippines are looking forward to independence. Now they have a share in their government. Their people are not United States citizens. They are rapidly advancing in civilization.

554 Guam is governed by a naval officer.

f. International Relations

295 to 299 Cuba is a protectorate of the United States. She is completely self-governing but may not enter into any treaty or agreement without the consent of the United States.

280 to 341 Spanish America. The Monroe Doctrine declares that any attempt made by any trans-oceanic power to extend its influence in America will be considered an act unfriendly to the United States.

338 La Guaira, Venezuela. This does not mean that the United States will prevent a nation's demanding and getting justice.

352, 384, 421, 450, 463, 482 Communications with foreign countries are made by the State Department through ambassadors or ministers maintained in every capital and consuls in every important city of the world.

13, 278 Fish; 345 Seals. The United States has urged arbitration as the best method of settling difficulties. Disagreements concerning fisheries, sealing, boundaries, etc., arising between the United States and Great Britain have been settled by arbitration.

15. COMMUNITY CIVICS

By ARTHUR WILLIAM DUNN, A.M.

SPECIALIST IN CIVIC EDUCATION, U. S. BUREAU OF EDUCATION, WASHINGTON, D. C.

"A characteristic feature of community civics is that it focuses attention upon the 'elements of community welfare' rather than upon the machinery of government. The latter is discussed only in the light of a prior study of the 'elements of welfare' and in relation to them."

"The aim of community civics is to help the child to know his community — not merely a lot of facts about it, but the meaning of his community life, what it does for him, and how it does it, what the community has a right to expect from him, and how he may fulfill his obligation, meanwhile cultivating in him the essential qualities and habits of good citizenship."

"Community civics applies this point of view to the study of the national community as well as to the study of the local community." ("The Social Studies in Secondary Education," Bulletin, 1916, No. 28, p. 23, U. S. Bureau of Education.)

(The following classification is based upon, and follows the organization of, Dunn's "The Community and the Citizen," copyrighted and published by D. C. Heath & Company.)

1. What is a Community?

38 Hudson Valley. A group of neighboring farmers may be a community.

7 Boston; 28 New York. Or the community may be a city.

8 Old State House, Boston. Each state in our Union is a community.

87 to 95 National capital. Our nation is a community with its center at Washington.

7 Quincy Market, Boston; 387 Market place, Nuremburg, Germany; 395 Vegetable market, Brussels, Belgium. The country and city communities have certain interests in common.

2. The Site of the Community

25 to 31 New York City. Nature seems to have planned the Hudson River as the site of the greatest city on the Atlantic coast.

217 Seattle, Washington; 386 Hamburg, Germany; 230 San Francisco, California. Cities spring up where there is a good harbor.

61 Pittsburgh, Pa. The junction of two navigable rivers is a good situation.

167 Minneapolis, Minn. Manufacturing towns often grow near the falls of a river.

264 Quebec, Can.; 267 Montreal, Can. The head of an estuary is a fine location for a commercial city.

139 Chicago. A rich region must have a center for trade.

174 St. Louis, Mo. Where natural routes cross, will be found a city.

119 New Orleans, La. The fertility of the soil attracts people.

214 Mining camp, Nevada; 187 Butte, Mont. The presence of mineral ores will cause towns and cities to develop.

216, 217 Seattle, Wash. An abundance of forest products will cause the growth of a community.

61 Pittsburgh, Pa. A river and its branches may divide a city into parts more or less distinct with different characteristics.

31 New York City; 43 Busy path of commerce; 48 Mouth of Erie Canal.

154 Sault Ste. Marie, Mich. If it were not for the wonderful development of transportation and communication it might have been very difficult for our great country to hold together.

3. What People in Communities Are Seeking

60 Atlantic City, N. J.; 72 June carnival, Pennsylvania. Men desire life and health.

29 Wall St., New York City; 139 Chicago shops; 351 London Bank. The desire for wealth is very strong.

342 Peary expedition; 575, 576 Victoria Fall, South Africa. Men want knowledge. It is this desire that led Peary to the Arctic regions and Livingstone to the heart of Africa.

90 Washington; 95 Congressional Library; 360 York and its cathedral; 422 Champs Elysees, Paris, France. Men take pleasure in beautiful buildings and streets.

6 Old North Church, Boston; 425 Notre Dame, Paris; 451 St. Peter's, Rome; 458 Cathedral, Milan, Italy; 503 Jumma Mosque, Delhi, India; 501 Pilgrims bathing in Ganges, India; 568 Temple of Karnak, Egypt. The religious desire is characteristic of man. In every community there are certain things men do to gratify it.

60 Atlantic City, N. J.; 387 Market place, Nuremburg, Germany; 466 Market place, Serajevo, Bosnia. Men desire companionship.

260 Hawaii. The school trains children for citizenship.

6 Old North Church, Boston; 29 Trinity Church, New York City; 458 Cathedral, Milan, Italy. The church helps men to live harmoniously.

8 Old State House, Boston; 87 to 95 Washington, D. C. Government establishes and enforces laws for our common good which all should willingly observe.

4. The Family

214 Mining camp, Nevada. In the far west there are mining towns and in the north, lumber camps composed almost entirely of men without families — the community is liable to be lawless.

139 Chicago. There are thousands of unfortunate homeless children adrift in our great cities.

519 A study of Chinese faces. It is largely in the drifting homeless population that the disorderly and criminal classes are found.

113 Lincoln's birthplace. The early settler cut down trees from the forest and built a log house.

488 Plowing with primitive plow, Russia.

497 Threshing floor; 498 Grinding wheat, Palestine. "The grain was threshed by hand and ground into meal in a homemade stone mill." These primitive ways of working are no longer used in the United States.

2 Moose, Maine; 189 Elk, Montana. For fresh meat they had to depend chiefly upon game from the forest.

409 Spinning wheel, Norway; 506 Weaving shawls on hand loom, Kashmir. A spinning wheel and hand loom were set up in the house.

281 Home of peon, Mexico; 298 Farm home, Cuba; 362 Wordsworth's home, England; 373 A highland home, Scotland; 410, 411 Homes of peasants, Norway. The family remains one of the most important means to provide for the wants of its citizens.

5. The Home and the Community

96 Washington's home, Mt. Vernon, Va.; 181 Bryan's farm, Nebraska. There is no kind of property that gives such satisfaction to the owner as does a home.

61 Pittsburgh, Pa. In large cities where people are crowded together, they may resort to low lands where it is unhealthful and in danger of floods.

455 Tenement in Palermo, Italy. These tenement dwellings involve all sorts of evils.

339 La Guaira, Venezuela; 514 Hong Kong, China. The unsanitary conditions invite epidemics of disease.

10 Common, Lexington, Mass.; 51 Palisades, N. J. Parks and playgrounds are being established.

6. The Making of Americans

32 Ellis Island, N. Y. Thousands are coming every year.

162, 166 Minnesota. There are sections of the Northwest where almost the entire population is Scandinavian.

135 Rossford, Ohio. Glass makers are often Belgians.

227 Interior of canning factory, Astoria, Oregon; 519 A study in Chinese faces. In 1882 Congress passed a law known as a Chinese Exclusion Act.

72 Children dancing around Maypole, Pennsylvania; 117 Negroes, Louisiana; 175 Apple pickers, Missouri; 187 Butte, Mont. All

persons born or naturalized in the United States are citizens. Children under twenty-one become citizens by the naturalization of their parents. A foreign woman becomes a citizen if she marries a United States citizen or if her husband becomes naturalized.

7. How the Relations Between the People and the Land Are Made Permanent and Definite

204 Ute Indian, Colorado. The hunting life of the Indian made a fixed dwelling place undesirable.

178, 179, 180 Prairie lands, South Dakota and Nebraska. Our nation has come into possession of vast territories that would be useless if they were not occupied.

180, 181, 184, 185 Farms in Nebraska and Kansas. Most of this land was sold and settled under the Homestead Act.

136 Modern methods of corn harvesting, Indiana. After the Revolutionary War, settlers began to enter the Ohio Valley and claim land for farms.

209, 210 Desert and irrigation dam, Arizona. It has constructed reservoirs and a network of canals.

229 Yosemite Valley, Cal. Another part of the public land consists of the national forests.

213 Ogden, Utah; 220 Seattle, Wash. Governments may compel premises to be kept clean.

6, 7, 8 Boston; 28, 29, 30 New York. Within certain limits cities do not allow wooden buildings.

230 San Francisco; 31 New York City; 139 Chicago; 273 Winnipeg, Manitoba. Communities may grant the use of their highways to private corporations that render important public service, such as street railways, telephone, and telegraph companies and water and gas companies.

8. How the Community Aids the Citizen to Satisfy His Desire for Health

292 Tortilla making, Salvador, C. A.; 411 Milking the goats, Hardanger Fjord, Norway. Life and health were almost wholly dependent upon the efforts and the arrangement of the family itself.

10 Lexington Common, Mass.; 33 Dining room and living room; 37 Washington's headquarters, Newburgh, N. Y.; 57 Modern dairy, Plainsboro, N. J., 373 Highland home, Scotland. The most important precaution against disease is cleanliness.

10 Lexington, Mass.; 28 New York City; 51 Palisades, New Jersey; 93, 95 Washington, D. C.; 126 San Antonio, Texas. Of great importance in large cities is the system of parks.

52 Docks, Hoboken, N. J.; 514 Hong Kong, China. Any ship that enters our harbor may bring with it disease from the slums of Europe or Asia.

61 Pittsburgh, Pa.; 187 Butte, Mont. When a factory pollutes the stream that runs by it, it threatens the health, not only of the

immediate community, but also of other communities farther down the stream.

141 to 144 Meat packing houses, Chicago, Ill. Laws were passed providing for the inspection of meats put up.

295 to 299 Cuba; 247 to 256 Panama; 546 to 553 the Philippines. They have caused such dread diseases as smallpox and yellow fever to disappear almost completely from regions occupied by our army in Cuba, Panama, and the Philippines.

9. How the Community Aids the Citizen to Protect His Life and Property

6 Boston; 29 New York City. Now every large city is supplied with water from a reliable source.

526 Tokyo, Japan. Seven-eighths of the fires that occur are the result of a lack of proper precautions in building.

214 Mining camp, Nevada; 89 Supreme Court, Washington, D. C. One of the most sacred rights of a citizen is the right to a fair trial.

8 Boston. The police of a city patrol its streets at all times.

6 Boston; 461 Gratz, Austria; 463 Vienna, Austria; 486 Kief, Russia;

273 Winnipeg, Manitoba. Another important arrangement for the safety of property and life is a system of street lighting.

43 Busy path of commerce in central New York; 31 New York City. The thousands of people who travel on the cars each day are at the mercy of those who run the trains.

74 to 79 Coal mines, Pennsylvania. In the year 1911, there were 2,719 men killed and 31,334 injured in the coal mines of the United States.

100 Hampton Roads, Va.; 242 Submarines and battleships, San Diego Bay, Cal. 254 *U. S. S. Missouri*, Panama Canal; 585 American fleet visiting Sydney, Australia. The navy is another means of national protection.

25, 26 New York Harbor; 128 Conneaut, Ohio; 164 Ore docks, Two Harbors, Minn; 242 San Diego Bay, Cal. The national government has done a great deal for the protection of life and property by improving harbors.

99 Life savers, Va. Every year the life savers perform deeds of heroism.

119 New Orleans, La.; 148 East St. Louis, Ill. The national government has constructed levees.

10. The Relation Between the Community and the Citizen in Business Life

11, 12, 15 Factories in Mass.; 142, 143 Packing houses, Chicago; 151 Detroit, Mich. With the introduction of machinery the division of tasks has been more complete.

14, 15 Cotton mill, Lawrence, Mass.; 22, 23, 24 Silk mill, Manchester, Conn.; 132, 133 Rubber factory, Akron, Ohio; 134, 135 Glass factory, Rossford, Ohio. In well organized factories, each work-

...e country are given over to fruit raising.

127 Texas; 165 Minnesota; 185 Kansas; 188 Montana; 19(some parts of the West cattle or sheep raising takes farming.

74 to 79 Coal mining in Pennsylvania; 155 to 157 Copp(Michigan; 176 Joplin, Mo.; 187 Butte, Mont.; 225 (Nevada. In some parts of the country mining is t occupation.

1 Maine; 162 The pineries, Minnesota; 215 to 217 Wash some places lumbering is the chief occupation.

13 Cod, Gloucester, Mass.; 226, 227 Salmon, Astoria, Or(places the people are occupied with fishing.

14, 15, 16 Lawrence, Mass. One region becomes famous ton manufactures.

22 to 24 So. Manchester, Conn.; 53 to 55 Paterson, N regions become famous for their silk manufactures.

47 Buffalo, N. Y.; 149 Celery fields, Kalamazoo, Mich.; Dakota. The gardener who gives his whole time vegetables receives in return bread from wheat ra Dakotas.

1 Maine woods; 224 Oregon. The history of our counti very largely a story of the clearing of forests.

61 Draining land, Wisconsin; 210 Phoenix, Ariz. Some had to be reclaimed for agriculture.

55 Copper mines, Calumet, Mich.; 163 Iron mine, Michiga mines, Alabama. There were mines to be opened.

26 New York Harbor; 52 Docks at Hoboken, N. J.; 12(Harbor, Ohio. 119 New Orleans, La.; 106 Savannal history of the country has been greatly influenced by of commerce.

178, 179 South Dakota; 11, 12 Shoe factory, Massachusetts; 30 New York City. 139 Chicago; 29 Wall St., New York City; 87, 94 Washington, D. C. The men and women who are today working on the farms or in the mines, in factories and shops, in stores and offices, or in any other lines of business, are as truly doing their country a service as those who hold the offices of government.

20 Paper factory, Holyoke, Mass.; 40 Collar factory, Troy, N. Y.; 152 Ford factory, Detroit, Mich. The employer is responsible for the welfare of those who work for him.

11, 12 Shoe factory, Massachusetts; 82 Locomotive works, Philadelphia, Pa.; 62 to 67 Iron mills, Pittsburgh, Pa. No man's business belongs to himself alone; it belongs to the community.

132, 133 Rubber works, Akron, Ohio; 11 Shoe factory, Massachusetts; 14 to 16 Cotton mill, Lawrence, Mass. The community has a right to expect honest goods. It has the right to expect good workmanship.

29 Wall St., New York City; 351 Bank of England, London, England. By far the greater part of the business dealings between individuals, between communities and between nations is carried on by a system of credit.

11. How the Government Aids the Citizen by Controlling Business Relations

8 Old State House, Boston; 11, 12 Shoe factory, Massachusetts; 14 to 16 Cotton mill, Lawrence, Mass. When men wish to organize as a corporation it is almost always the state that gives them authority.

26 New York City; 52 Ocean liners, Hoboken, N. J.; 48 Erie Canal, Buffalo, N. Y.; 106 Savannah, Ga.; 43 Busy path of commerce, Central New York; 154 Sault Ste. Marie, Mich.; 164 Two Harbors, Minn.; 170 Keokuk, Iowa; 217 Shipping lumber, Washington. Congress was given power to regulate commerce with foreign nations and among the several states and with the Indian tribes.

84 Mint, Philadelphia, Pa. Congress was given power to coin money.

386 Hamburg Germany; 422 Paris, France; 433 Barcelona, Spain, etc. Congress has established a consular system.

527 to 529 Rice, Japan; 530 Tea, Japan; 310 Coffee, Brazil; 317 Cattle, Argentina; 412 Paper, Norway; 419 Sugar, Sweden; 488 Wheat, Russia. The consuls investigate the products and manufactures of the countries to which they are sent.

357 Harvesting wheat, England. Consuls try to create a market for United States products, in those countries whose resources are limited.

52 Hoboken, N. J.; 347 Liverpool, England; 307 Rio de Janeiro, Brazil. 314 Buenos Aires, Argentina; 386 Hamburg, Germany. The consuls try to stimulate friendly business relations between our country and all the world.

43 Central New York; 48 Erie Canal, Buffalo, N. Y.; 61 Pittsburgh, Pa.

154 Sault Ste. Marie, Mich. An Interstate Commerce Commission with authority to inquire into the management of common carriers.

122, 123 Oil region, Beaumont, Tex. In 1890, passed an anti-trust law.

141 to 144 Meat packing, Chicago, Ill. In 1906, a Food and Drugs Act.

93 Washington, D. C. The Department of Agriculture, the Department of Commerce, the Department of Labor are means of national coöperation.

12. How the Community Aids the Citizen in Transportation and Communication

71 Wagon, Crawford Co., Pa.. It cost $125 to haul a ton of goods from Philadelphia, Pa. to Pittsburgh, Pa. by wagon..

112 Tobacco field; 124 Cotton gin, Texas; 147 Loading oats, Illinois.

149 Celery fields, Kalamazoo, Mich.; 162 Minnesota pineries. Ninety-five per cent of every load by train, steamship or express must be carted over a highway.

195 Rocky Mountain Divide, Wyoming; 221 Mt. Hood, Oregon. Where there are hills the cost of hauling is twice as much as in level country for only half as much can be hauled in each load.

48 Mouth Erie Canal, Buffalo, N. Y.; 61 Pittsburgh, Pa.; 119 Levee, New Orleans, La.; 157 Houghton, Mich. The invention of the steamboat gave a great impetus to water transportation.

43 Railroad train, Central New York; 129 Train load of coal, Conneaut, Ohio. The rapid use of railways checked the use of rivers.

128 Conneaut, Ohio; 157 Loading ore on a boat, Houghton, Mich.; 164 Two Harbors, Minn. The commerce of the Great Lakes has steadily increased, and is today of enormous proportions.

48 Mouth of Erie Canal, Buffalo, N. Y. The Erie Canal is still an important highway.

154 Sault Ste. Marie, Mich. One of the largest of these is the canal at Sault Ste. Marie.

248 to 256 Panama Canal. The greatest canal ever undertaken is the Panama canal.

277 Western terminus of Canadian Pacific, Vancouver, B. C. Steam railways revolutionized transportation.

43 Electric railroad, Central New York. Another important step is the recent growth of electric interurban railways.

7 Boston; 31 New York. The question of transportation in cities is an important one.

6, 7 Boston; 29 New York City; 422 Avenue Champs de Elysees, Paris, France.

90 Washington, D. C.; 152 Detroit, Mich. First in importance is the street itself. Streets are for the use of the people.

339 Narrow streets of La Guaira, Venezuela. There are ordinances to prevent storekeepers and others from blocking the sidewalks with boxes or otherwise.

31 Many forms of transportation, New York City. Life in cities has been revolutionized by the development of rapid transportation by electric trolley çars, elevated railways and systems of subways.

273 Winnipeg, Manitoba; 28 *World* Building, New York City. There must be exchange of ideas. We have a postal system, the telegraph and telephone and the newspaper.

13. Waste and Saving

216 Port Blakely Mills, Puget Sound, Wash. In a well managed sawmill the waste is made into tool handles, chair rounds and other small articles.

122, 123 Oil region, Texas. From what was formerly wasted in refining petroleum are now produced paraffin, vaseline, dyestuffs, etc.

210 Roosevelt Dam, Phoenix, Ariz. The reclamation by irrigation of vast areas of waste land.

93 Washington, D. C. In the Department of Agriculture there is a bureau of soils.

172, 173 Iowa State College, Ames, Iowa. The national government coöperates with state governments many of whom have agricultural schools.

224 Great tree, Oregon. Our forest resources have been sadly wasted.

222 Crater Lake, Ore.; 228, 229 Yosemite Valley, Cal. The national government has set aside a large number of national forests.

49, 50 Niagara Falls, N. Y. Niagara Falls and other sources of water power have been harnessed to generate electrical power.

14. How the Community Aids the Citizen to Satisfy His Desire for Knowledge

260 Public school, Hawaii. Education is not only a privilege; it is a duty.

95 Congressional library, Washington, D. C. There are thousands of libraries all over the country.

172, 173 Iowa State College, Ames, Iowa. A number of states provide state universities.

15. Civic Beauty

64 Pittsburgh, Pa.; 163 Burt Mine, Minnesota. Hills are cut away for the resources they contain.

61 Pittsburgh, Pa.; 216 Port Blakely Mills, Puget Sound, Wash. Streams are lined with ugly and noisy factories and clogged with refuse.

63 Pittsburgh, Pa.; 68 Coke ovens, Connellsville, Pa. The sky is obscured with smoke.

57 Washington's headquarters, Newburgh, N. Y.; 5
House, Washington, D. C. The place to begin
community is at home.

9 Longfellow's home, Cambridge, Mass.; 10 Lexingtor
first essential to beauty is neatness and orderliness

373 Highland home, Scotland. There is almost alway
vines and flowers to grow if only in window boxe

354 Shakespeare's home, England; 355 Anne Hathaway'
land; 360 York, England; 422 Paris, France. W
and whole streets present an unbroken view of beai

83 School gardens, Philadelphia, Pa. School children
vacant lots, barren, disorderly places into beautifu
vegetable gardens.

305 Avenida Rio Branco, Rio de Janeiro, Brazil. The st
property.

28, 29, 31 New York City; 337 Street in Barranquilla, C
Bank of England, London, England. In cities goo
are perhaps the first essential to beautiful streets.

90, 93 Washington, D. C.; 339 La Guaira, Venezuela;
Venezuela. In the matter of clean streets, prevent
than cure.

90, 93 Washington, D. C.; 222 Crater Lake, Ore. Amo
beautiful objects in nature are trees.

71 Crawford Co., Pa. What is more beautiful than a
lined with trees?

220 Seattle, Wash. A great deal of monotony is prod
streets.

273 Winnipeg, Manitoba. Telegraph and telephone po
sightly.

93, 95 Washington, D. C.; 126 San Antonio, Tex.; 312
Uruguay. 316 Buenos Aires, Argentina; 324 San
329 Monte Misti. Peru. 340 Caracas

7, 8 Boston, Mass.; 31 New York City. As wires are disappearing, so is smoke.
405 Copenhagen, Denmark. Art museums are being established.
90, 93 Washington, D. C. Cities themselves are more thoughtfully planned.
212 Salt Lake City, Utah; 220 Seattle, Wash. One of the first steps toward making good citizens is to give them pleasant surroundings.

16. How the Community Aids the Citizen to Satisfy His Religious Desire

295 Havana, Cuba; 324 Santiago, Chile; 335 Bolivia; 109 St. Augustine, Fla. The Spaniards made their conquests in the name of religion.
6 Old North Church, Boston, Mass. The Pilgrims came to find freedom of worship.
87 Capitol, Washington, D. C. Congress can not make any law respecting the establishment of religion.
6 Old North Church, Boston, Mass.; 29 Trinity, New York City; 36 Church at Sleepy Hollow, N. Y.; 109 Old Spanish Church, St. Augustine, Fla.; 212 Mormon Temple, Salt Lake City, Utah. Our government allows the greatest personal liberty in religion.

17. How the Cities of a Community Govern Themselves

87, 95 Washington, D. C. Government is the servant of the people, not their master.
96 Washington's old home, Mt. Vernon, Va.; 181 Farm home, Lincoln, Neb. The state prescribes the rules for family relations.
11 Factory, Massachusetts; 159 Barns and cattle, Wisconsin; 160 Corn crop, Wisconsin. 188 Ranch, Montana. The state protects our property, etc.
28 City buildings, New York City. Local governments are merely branches of state governments. Their duties are chiefly administrative.
7 Town Hall, Boston; 28 City building, New York City. Matters of local interest are in the hands of local government.
43 Transportation, Central New York. Matters of more general interest are regulated by the state.
87, 88 Washington, D. C. Laws are made by the legislative branch.
91 White House, Washington, D. C. The enforcement of these laws is intrusted to the executive branch.
89 Supreme Court, Washington, D. C. If any question arises as to the meaning of the laws, it is finally settled by the judiciary.
28 City Building, New York City; 88 Congress, Washington, D. C. The right to vote for representatives in the government is a privilege prescribed by state constitutions.
243 to 246 Alaska. Women in Alaska have the right to vote.
8 Boston; 29 New York City; 109 St. Augustine, Fla. Difference of

opinion makes political parties. The party may be a local party, concerned with such a question as paving a street.

117 Negroes, Mississippi. Parties may be national, arising out of some great question, as the extension of slavery.

88 Congress, Washington, D. C. At first the representatives of each party in Congress used to nominate candidates for President and Vice-President.

110 Negro, Florida; 117 Negroes, Mississippi; 124 Cotton gin, Texas; 204 Ute Indian, Colorado; 227 Canning factory, Astoria, Ore. The right of citizens of the United States to vote shall not be abridged on account of race, color or previous condition of servitude.

9, 10 Colonial houses, Massachusetts. In colonial times, the right to vote was denied to those who did not own a certain amount of property.

6 Old North Church, Boston; 29 Trinity Church, New York City. In colonial times, it was common to deny the vote to all who were not members of the church.

198 Colorado; 218 Washington; 233 California; 184 Kansas; 210 Arizona. Colorado, Washington, California, Kansas and Arizona have women suffrage. They all are progressive and prosperous.

18. Changing Methods of Self-Government

87 to 90 Washington, D. C. Few of the people actually take direct part in the government — not many citizens can hold office.

96 Mt. Vernon, Va. The men who will best look after community business are most often men who have large interests of their own.

88 The Capitol, Washington, D. C. The choice of a good President depends on the choice of a good man.

25, 26, 30 New York City. In large communities, it is difficult to know the various candidates and their merits.

88 President Wilson, Washington, D. C.; 146 Lincoln's tomb, Springfield, Ill. To secure united action, there must be organization under leaders.

87, 88 Washington, D. C. The defeated parties should have representation and their views should be considered.

220 Seattle, Wash. The "recall" is used especially in the west to remove officials who are not properly fulfilling the obligations of office.

75, 76 Miners, Pennsylvania; 107 Savannah, Ga.; 115 Columbia, Tenn.; 147 Farmers, Illinois; 152 Factory men, Detroit, Mich.; 161 Farmers, Wisconsin; 167 Minneapolis, Minn.; 175 Farmers, Missouri. "The initiative" and "referendum" are methods by which people themselves take direct action in law making. These are types of people.

117 Negroes, Miss.; 227 Canning factory, Astoria, Ore. The chief argument against the "initiative" and "referendum" is that the

people as a whole are not sufficiently informed to vote upon important laws.

89 Supreme Court Room, Washington, D. C. Party feeling should not be allowed to enter into some appointments, such as judges.

253 London; 383 Berlin; 421 Paris; 462 Vienna, Austria Hungary. In some foreign countries, young men go into training for public service.

11 Factory hands, Massachusetts and 152 Detroit, Mich.; 103 Farmers, South Carolina; 124 Farmers, Texas; 144 Packers, Chicago. In our country, the feeling seems to prevail that every citizen is competent to hold an office if he can get it.

19. The Government of Rural Communities

6 Old North Church, Boston. In early New England, a town was a little village with its surrounding farms governed by all the freemen who belonged to the church.

7 Town House, Boston. The town meeting, held in the town house, chose the officers and levied the tax.

96 Mt. Vernon, Va.; 104, 105 Rice fields, South Carolina; 117 Cotton plantation, Mississippi. The South was rich farming land, so the colonists scattered to large plantations and county government developed.

38 Hudson Valley, N. Y.; 47 Farm, Buffalo, N. Y.; 61 Pittsburgh, Pa.; 71 Crawford Co., Pa.; 69 Oil fields, Pennsylvania. New York and Pennsylvania, lying between New England and Virginia, developed both township and county governments.

165, 166 Country, Minnesota; 178, 179 Country, South Dakota; 190 Sheep range, Idaho; 188 Ranch, Montana; 180, 181 Country, Nebraska. The country system is more practicable in the West, for the population is widely scattered.

25 to 31 New York City; 139 Chicago. Some counties are occupied wholly by large cities.

237 to 240 Los Angeles County, Cal. The present law in Los Angeles County provides for the election of not more than three officers in one year.

228 to 242 California. By state law in California each county has the right to adopt its own charter.

20. The Government of Cities

6 to 8 Boston; 25 to 31 New York City; 61 Pittsburgh, Pa.; 121 Oklahoma City, Okla.; 139 Chicago; 167 Minneapolis, Minn.; 212 Salt Lake City, Utah. 213 Ogden, Utah; 220 Seattle, Wash.; 230 San Francisco, Cal. The growth of cities in the United States has been very rapid and they have brought many serious problems.

61 Pittsburgh, Pa.; 139 Chicago. American cities are constantly being made over.

128, 131 to 135 Ohio; 228 to 242 California. Some states as Ohio and California allow their cities to draft their own charters.

28 City Building, New York City. City government is most commonly vested in a council and mayor.

21. The Government of the Nation

87, 88 Washington, D. C. Congress shall consist of two houses, a Senate and a House of Representatives.

88 President Wilson, Washington, D. C. The President is the chief executive officer. He may convene either or both houses; he must give to them his message.

92 Cabinet room, Washington, D. C. The President with the consent of the Senate appoints the Cabinet.

384 Berlin; 435 Madrid, Spain; 526 Tokyo, Japan. The Secretary of State maintains relations between the United States and other countries. Through him government notes are sent and treaties such as the Panama treaty are made.

448 Switzerland; 452 Rome; 578 Hunter, South Africa. Through him the rights of Americans in foreign countries are looked after.

282 City of Mexico; 338 La Guaira, Venezuela. If any of the independent countries of North or South America get into trouble with any other nation, our State Department, acting under the Monroe Doctrine, is an interested party.

29 Sub Treasury, New York City; 84 Mint, Philadelphia; 94 Public Buildings, Washington, D. C. The Secretary of the Treasury is the financial manager of the national government.

29 Sub-Treasury, New York City; 87 Capitol, Washington; 90 Public Buildings, Washington, D. C.; 95 Congressional Library, Washington, D. C. He controls the construction and maintenance of public buildings.

99 Life saving service, Va. The Secretary of the Treasury has charge of the life-saving service.

39 West Point, N. Y.; 90 Navy Building, Washington, D. C. The Secretary of War has control, under the President, of the military establishment of the nation.

25 New York Harbor; 120 Mississippi mouth; 148 Dikes, East St. Louis, Ill. He administers river and harbor improvements.

257, 258 Porto Rico; 546 to 553 Philippines. He directs the Bureau of Insular Affairs, which supervises the civil government of Porto Rico and the Philippines.

100 Hampton Roads, Va.; 242 Submarines and battle ships, San Diego, Cal.; 296 Wrecked battleship *Maine,* Havana Harbor; 254 *U. S. S. Missouri* in Panama Canal; 585 U. S. fleet, visiting Australia. The Secretary of the Navy superintends all matters pertaining to the construction, manning, equipment and employment of vessels of war.

554 Guam. Guam is governed by the United States naval officer stationed there.

191 to 197 Yellowstone Park; 220 Crater Lake Park; 228, 229 Yosemite Valley, Cal. The Secretary of the Interior has charge of public lands and care of national parks.

12, 14, 16 Machinery patented, Massachusetts; 62 to 67 Machinery patented, Pittsburgh, Pa. He has charge of the giving of patents.

182 Sioux Indians, Nebraska; 204 Ute Indians, Colorado. He takes care of Indian affairs.

210 Roosevelt Dam, Arizona. The Secretary of the Interior has charge of the reclamation service.

75, 76 Coal miners, Pennsylvania. He promotes improvement in methods of mining and safety of miners.

38 Farms, Hudson Valley, N. Y.; 85 Delaware; 104, 105 Rice fields, South Carolina; 118 Peanuts, Arkansas; 147 Oats, Illinois; 166 Potatoes, Minnesota; 175 Apples, Missouri; 199 Dry farming, Colorado. The Secretary of Agriculture promotes the general agricultural interest of the country.

224 Great trees, Oregon. He administers the forest service.

71 Crawford Co., Pa. He assists in the development of good roads.

43 Central New York; 48 Erie Canal, New York; 52 Docks, Hoboken, N. J.; 61 Pittsburgh, Pa.; 106 Savannah, Ga.; 119 New Orleans, La.; 154 Sault Ste. Marie, Mich.; 217 Washington; 13 Cod, Gloucester, Mass.; 226 Salmon, Astoria, Ore. The Secretary of Commerce is to promote the commercial interests of the nation at home and abroad. He has charge of the Bureau of fisheries.

4, 5 Marble workers, Proctor, Vt.; 11, 20 Factory hands, Massachusetts; 53 to 55 Silk workers, New Jersey; 63, 65, 66, 68 Men in steel mills, Pittsburgh, Pa.; 74 to 79 Coal miners, Pennsylvania; 82 Baldwin locomotive works, Philadelphia, Pa.; 131 to 133, etc. Rubber factory workers, Akron, Ohio. The Secretary of Labor is charged with the duty of fostering, promoting and developing the welfare of the wage-earners of the United States.

32 Ellis Island, N. Y. He has care of the Bureau of Immigration.

89 Supreme Court Room, Washington, D. C. The judicial power of the United States shall be vested in one Supreme Court and such inferior courts as shall from time to time be established by Congress.

243 to 246 Alaska; 259 to 261 Hawaii. Alaska and Hawaii are territories.

257, 258 Porto Rico; 546 to 553 Philippines. Porto Rico and the Philippines are dependencies.

Note: — This page for teachers' notes.

16. CITIES OF THE WORLD

By JOHN NOLEN, A.M., Sc.D.

CITY PLANNER, LANDSCAPE ARCHITECT, BOSTON, MASS.

The city looms big in the modern world. Not only in the United States, but in every progressive country, population is increasing very much more rapidly in cities than in rural districts, especially in England, America, and Germany. Man has entered on an urban age. Already 80 per cent. of the population of the United Kingdom dwells in cities.

In the United States the growth of cities is one of the most striking facts, as the following percentages of the cities' population here given illustrate: — In 1880, 29.5 per cent. of the people of this country dwelt in cities; in 1890, 36.1 per cent.; in 1900, 40.5 per cent; in 1910, 46.3 per cent. Today we may safely say that virtually one-half of the population of the United States is a city population. In contrast it may be noted that a hundred years ago only about 5 per cent. of the population of this country was living in places of 8,000 inhabitants or more.

The growth of population in cities is directly reflected in their greatly increased wealth and influence. The city has become one of the main problems of modern democratic society, and is already the most accurate measure of our civilization and culture.

Cities, like people, have temperament and personalities of their own. It has been said that American cities are all alike. To some extent this is unfortunately true, when we compare our cities with those of the Old World. Yet what different types are represented by a comparison, for example, of New York with New Orleans, of Philadelphia with San Francisco, of Boston with Washington, of Chicago with San Antonio. The natural distinctiveness of cities due to origin, history, tradition, topography, climate, dominant function, or what not, should be looked upon as a characteristic to be preserved

prises upon which mankind has seriously launche
e full of possibilities for good.

The ancient city was mainly military, while the mode
primarily industrial and commercial. The study of
m early days to the present, especially in this ind
, is full of interest and profit. In fact, it is essenti
kground to the understanding of man's developmer
a basis for an efficient participation in modern life.

PART I

THE GROWTH AND PLANNING OF CITIE

A. CITY MAKING

he modern movement for city planning in the United States
l to have begun about 1890, with a special stimulus along
s in 1893 through the influence of the World's Fair at C
arge amount of city planning, much of it of a high order, w
lier. In no sense, however, did it represent a movement—
widespread, and it was not continuous nor persistent.

lotable examples of earlier city planning are: William Pen
Philadelphia in 1682, and the plans for other Pennsylvani
Reading, for instance, which were connected with it; the p
lliamsburg, Va., in 1699; Oglethorpe's plan for Savannah, i
great plan of L'Enfant for Washington, D. C., in 1790.

he ideas of most significance in the modern city planning
it are: The increasing dependence of the individual upon th
ity of the city as a whole; the importance of planning, not
the routine requirements, but also for those of the future;
essity, for reasons of economy as well as success, to co-ordir

30 Broadway from Bowling Green, New York City.
90 Pennsylvania Avenue from White House to Capitol.
93 Panorama of Washington from monument east to Capitol.
126 General view of San Antonio, Texas.
212 Salt Lake City, Utah.
230 General view of Market Street, San Francisco.
248 Looking down on the city and bay of Panama.
264 View of Quebec from Dufferin Terrace.
282 City of Mexico.
304 Lower city and harbor, Bahia, Brazil, So. Am.
326 The bay and city, Valparaiso, Chile.
338 La Guaira, Venezuela.
360 A glimpse of the old city of York, England.
365 View of the heart of Edinburgh, Scotland.
375 General view of Patrick's Bridge, Cork, Ireland.
386 Hamburg, Germany.
387 Market place, Nuremburg, Germany. General view.
389 Kleber place, in the heart of Strassburg, Germany.
401 View of a Dutch fishing village.
421 Bird's-eye view of Paris from Arch of Triumph.
422 Avenue des Champs, Elysées, Paris.
434 General view of Burgos, Spain.
435 Panorama of Madrid, Spain.
450 Rome from the balcony of St. Peter's.
457 Grand Canal, Venice, Italy.
472 General view, Constantinople.
473 Market and surroundings at Stamboul, Constantinople.
475 Athens and the Acropolis, Greece.
483 The Kremlin, Moscow, Russia.
492 Birds-eye view of Beyrout, Syria.
495 View of Jerusalem from Mount of Olives, Palestine.
526 Tokio, the Japanese capital.
558 Birds-eye view of Alexandria, Egypt.
586 Melbourne, Australia.

2. Places in which Civic Life Centers Including Monuments

28 New York City — old and new city halls.
87, 90, 91, 95 Washington, D. C.— The Capitol, White House, etc.
126 San Antonio, Texas — Alamo Plaza.
220 Seattle, Wash.— park and boulevard system.
283 City of Mexico, Mexico — soldier's monument.
309 Sao Paulo, Brazil — Municipal Theatre.
312 Montevideo, Uruguay — Plaza.
315 Buenos Aires, Argentina — government buildings.
324 Santiago, Chile — Plaza — also capital city.
340 Caracas, Venezuela — Halls of Congress.
351 London, England — Bank of England.
352 London, England — House of Lords.

Strassburg, Germany — Kleber Place.
Cologne, Germany — market.
Brussels, Belgium — market
Namur, Belgium — Citadel Park.
Copenhagen, Denmark — Queen Louise Bridge and park.
Stockholm, Sweden — monument.
Paris, France — Eiffel Tower.
Paris, France — flower market.
Paris, France — Grand Opera House and Opera Place.
Barcelona, Spain — Columbus monument.
Madrid, Spain — Fete grounds.
Rome, Italy — Plaza of St. Peters.
Innsbruck, Austria — monument — Maria Theresa Platz.
Gratz, Austria — public square.
Vienna, Austria — Graben.
Serajevo, Bosnia, Austria — market place.
Constantinople, Turkey — market place.
Athens, Greece — Constitution Square.
Petrograd, Russia — park by winter palace.
Warsaw, Poland — market.
Agra, India — Taj Mahal.
Delhi, India — space before Mosque.
Japanese garden.
Tangier, Morocco — market place.
Cairo, Egypt — great Nile bridge.
Cape Town, South Africa — parade grounds.
Melbourne, Australia — Parliament Building.

Historic Buildings and Other Places of Unusual Inte

Boston, Mass.— Old North Church.
Boston, Mass.— Faneuil Hall.
Boston, Mass.— Old State House.

87 Washington, D. C.— Capitol.
91 Washington, D. C.— White House.
95 Washington, D. C.— Library of Congress.
109 St. Augustine, Fla.— old slave market.
113 Hodgensville, Ky.— cabin, Lincoln's birthplace.
146 Marshall Joffre and French Commission at Lincoln's tomb.
154 Sault Ste. Marie, Mich.— greatest canal traffic.
208 Grand Canyon of the Colorado, Ariz.
241 San Gabriel Mission, Southern California.
264 Quebec, Canada — view from Dufferin Terrace.
300 Martinique, French West Indies — volcano.
349 London, England — Tower of London.
350 London England — Westminster Abbey.
353 Greenwich, England — Royal Observatory.
354 Stratford-on-Avon, England — Shakespeare's birthplace.
355 Shottery, England — Anne Hathaway's cottage.
360 York, England — cathedral.
361 Grasmere, England — lake and village.
362 Rydal Mount, England — Wordsworth's home.
367 Stirling, Scotland — castle.
369 Ellen's Isle, Loch Katrine, Scotland.
372 Ayr, Scotland — Burns' cottage room.
376 Blarney Castle, Ireland.
377 Lakes of Killarney, Ireland.
382 Giant's Causeway, Ireland.
391 Bingen on the Rhine, Germany.
425 Paris, France — Notre Dame.
427 Chamonix, France — glacier.
436 Granada, Spain — Alhambra.
439 Gibraltar.
445 to 448 Alpine towns and villages.
452 Rome, Italy — Coliseum.
453 Naples, Italy — Vesuvius.
458 Milan, Italy — cathedral.
472 Constantinople, Turkey — Golden Horn.
475 Athens, Greece — Acropolis.
478 Olympia, Greece — Temple of Zeus.
483 Moscow, Russia — Kremlin.
502 Agra, India — Taj Mahal.
525 Tokyo, Japan — Fuji-Yama.
565 Sphinx and Second Pyramid, Egypt.
567 Thebes, Egypt — colossi.
568 Karnak, Egypt — ruins.

4. Transportation

Cities are vitally dependent on transportation. It to a large extent determines their location and affects their growth. Local transportation for people and merchandise is an important problem of city life. See classification on Transportation.

Troy, N. Y.— linen collars.
Syracuse, N. Y.— shoes.
Syracuse, N. Y.— salt.
54, 55 Paterson, N. J.— silk.
59 Trenton, N. J.— pottery.
Philadelphia, Pa.— woolen.
Philadelphia, Pa.— locomotives.
125 Greenville, Tex.— cotton gin.
132, 133 Akron, Ohio — rubber.
151, 152 Detroit, Mich.— automobiles.
Astoria, Ore.— salmon canning.
269 Canada — linen manufacture.
271 Canada — beet sugar.
Canada — leather.
Orizaba, Mexico — cotton.
Nizhñi Novgorod, Russia — bells.
Srinagar, Kashmir — shawls.
Ratnapora, Ceylon — grinding gems.
Japan — shoe shop.
Kiryu, Japan — silk.
Philippines — manila hemp.

B. THE ELEMENTS OF CITY PLANS

1. Streets and Roads

building a city the first act usually is to lay out some kin
et system. The importance of a street in the city plan rests
that it is the channel of all the ordinary means of circulati
ic service, that it is essential to the profitable

29 Wall Street, the financial center of the United States. Picturing view of old Trinity Church on Broadway, at end of street.

30 Looking up Broadway from Bowling Green, New York City. Note narrow street, high buildings and resulting congestion of street traffic.

31 One of the chief problems of the street in large cities is that of transportation. A good example of the use of surface cars, elevated railroads and subways (note entrance).

90 Comprehensive view of Pennsylvania Avenue, Washington, D. C., from the White House to the Capitol. Notice Treasury Building and Post Office.

121 Clean, wide, well paved street in Oklahoma City. High building (in foreground) is unnecessary in city of this character.

139 State Street, Chicago. Wide street with ample sidewalks for shoppers. High buildings and inadequate transportation system have brought unnecessary congestion to the "loop district."

167 Nicollet Avenue, Minneapolis. A worthy center for retail trade. Like Fifth Avenue, New York, it is free from street railways.

230 Market Street, the main traffic way of San Francisco. A notable street in location, width and terminal views.

273 Main Street, Winnipeg, Canada, has the generous width of the prairies and the unfinished character typical of new cities of rapid growth in Canada and the United States. Compare with Avenida Rio Branco (305), a South American example of better city planning methods.

305 Avenida Rio Branco, Rio de Janeiro, Brazil. A new street laid out through the heart of a large city. Notice details of street works and character of buildings. High standards of street planning and suitable laws make this kind of improvement practicable in South America and Europe. Contrast American streets.

308 Rua 15th of November (Independence Day), Sao Paulo, Brazil. Narrow business street in the old Portuguese section of the city. In the newer parts the streets are wide and beautiful.

337 Quaint scene in one of the streets of Barranquilla, Colombia, South America. An example of street and buildings well adapted to local needs.

351 Threadneedle Street, London, England, with view of the Bank of England. A typical example of an important street intersection in the old city of London. Note irregular street lines and building locations and character of street traffic. At times this great center of business is very, very busy.

365 Princess Street and Waverley Gardens, Edinburgh, Scotland. The finest street in Scotland and one of the most beautiful in the world. A unique street composition, representing skill and planning worthy of the highest praise. The monument of Sir Walter Scott is notable as the dominant artistic feature.

380 Sackville Street, Dublin, Ireland, a street widened a century ago

way. Note houses facing on the canal.

Krystal-Gade, Copenhagen, Denmark. This street, its t flanking buildings are characteristic of Denmark. The teresting structure is the Round Tower of Trinity Ch view from which is very fine.

Avenue des Champs Elysees, Paris. One of the great s the world. It symbolizes the magnificence and no France. No description is adequate. It must be seen.

Street scene in Palermo, Sicily. In Southern Italy and S people work and play in the streets. They are sociable to gather, talk and carry on their occupations (sewing making) outdoors. The street scenes are always pictur

The Grand Canal is a main street or thoroughfare for just as the Champs Elysees is for Paris, Unter den Lin Berlin or Fifth Avenue for New York.

The Graben, a busy street in the Inner City, Vienna, Note uniformity of buildings and regularity of sky line.

Andrassy Street, Budapest, Hungary. Regular, almost nous development of a long straight business street. Ev orderly, clean and neat.

A good example of street life in Sofia, Bulgaria. The pe joy being outdoors. The sidewalk coffee house, the pict costumes and the easy going character of the men and shown in the picture are indications of habits of life d from our own.

Street scene in Constantinople, Turkey. Compare with Sof garia, and Vienna, Austria.

Krestchatik, principal street of Kiev, Russia, a city of people. Compare with European and American city stre ticing differences in construction and use.

View over the roofs of Damascus, Syria. The large semi-pipe-like construction is the steel covering o

laid out and developed to meet the needs of the people and not in imitation of other places.

513 Queen's Road, the busiest street in Hongkong, China. It offers many interesting contrasts to streets of Europe and America.

516 Street construction in Nanking, China. Men take the place of animals or motor engines in such work because they are cheaper.

542 A street scene in Seoul, Korea. Everyone wears white, even when the house-tops are covered with snow. Note that there are no wheeled vehicles and consequently no roads fit for them. The strength of the nation is in the coolie's back.

547 The Calle Real, or King Street, Manila, P. I. Narrow, uninteresting street.

557 Gates at one of main streets of Tunis, Africa. On the streets within, one sees camels, donkeys, medicine-men, snake-charmers, water-carriers, Mohammedan women with veils over their faces, fierce Arabs, French soldiers, Jewesses in white trousers, and Turks in bright pantaloons.

590 A street in Hobart (pop. 28,000), the leading city and capital of Tasmania. Much like an ordinary small modern American city with its telegraph and trolley poles.

2. Bridges and Viaducts

Bridges and viaducts span bodies of water or valleys or roads, thus affording passage and conveyance for people and goods. There are many types, the principal being arch bridges, suspension bridges, girder bridges, and sometimes mixed types. The choice of type for any particular location or purpose depends largely upon the cost, the strength or permanence desired, and the appearance. Masonry bridges of the arch type, where suitable, are ordinarily preferred for appearance.

27 Suspension Bridge, New York. Built at cost of fifteen million dollars. It required thirteen years, 1870–1883, to construct.

61 General view of bridges at Pittsburg. The Allegheny and Monongahela rivers unite to form the Ohio River where Pittsburg is now located. It has more bridges than any other city in the United States.

101 View of the Baltimore & Ohio Railroad Bridge at Harpers Ferry, W. Va., situated at the confluence of the Shenandoah and Potomac rivers.

170 Great power dam and locks in the Mississippi River at Keokuk, Iowa. This dam, with the power house, lock, dry lock, sea wall, and ice fender, all made of concrete, have a total length of two and one-half miles. The lock is 400 feet long and 110 feet wide.

174 Eads Bridge, St. Louis, Mo., costing over ten million dollars, with sections for railways to pass over it. It has also driveways for vehicles, and walks for foot passengers. The high arches provide the necessary clearance for large river steamboats.

hicles cross it. There has been a London Bridge s
The present bridge, completed in 1831, is 928 feet lo
feet wide. It consists of five granite arches.

The great Forth Bridge, spanning the Firth of Forth,
ferry, near Edinburgh, Scotland.

Patrick's Bridge, crossing the River Lee, Cork, Irela
constructed of limestone.

Suspension Bridge at Kenmare, County Kerry, in the
Ireland, not far from Killarney, and in the same scen

Stone and steel bridge over the historic Rhine at Bonn.

Bridge at Namur, Belgium, over the River Meuse, the natu
tier between Belgium and Germany.

View of the docks, and the bridge, lifted to allow vessels
at Rotterdam. Economic and attractive development c
as in all Dutch cities.

The Queen Louise Bridge leads to Copenhagen proper to t
part of a section called Frederiksborg. Along either si
stream are parks and beautiful, broad streets. Note
proaches to bridge.

Bridge in the very heart of Stockholm, connecting the
tral town of Staden with Norrmalm, a northern suburb.
if properly bridged, unify a city, and provide facilities
velopment on both sides.

St. Michael's Bridge, Paris, is one of the chief passagewa
the Latin Quarter to the larger part of the city that lie
right bank of the Seine. The flower market is shown as
at six o'clock in the morning, and the universal love of
by French people of all classes is here illustrated.

Chapel Bridge, familiar to all travelers, crossing the Rive
Lucerne. A roofed bridge which winds across the ri
nishing a most convenient connection. The tower near
ter of the bridge is the old Wasserthurn.

472 A busy bridge connecting Stamboul, the seat of the Turkish government, with Galata, the business center of the town, toward which we are looking. The high tower in Galata is used as a lookout for fires.

500 The Howrah Bridge over the Hooghly River, Calcutta, India.

560 Drawbridge over the Nile, Egypt. Traffic across the bridge is mixed, and there appears to be no regulation or order.

3. Waterways, Water Fronts, and Harbors

The proper development of water frontages, harbors and docks is essential to practical city building. The most obvious division of the waterways is into wide and narrow. The former comprise the large lakes, the ocean with its wide straits, bays, and other frontages, broad rivers, and in general, all those waters on the borders of which vessels can be moored at right angles to the shore. Narrow waterways consist of canals, canalized rivers, and some narrow frontages of the ocean. It may be said in general that the width of waterway is not so important as its continuation as far as possible into the upland. Many narrow waterways, like those at Cleveland and Chicago, for example, carry great tonnages, thus serving the industrial districts which they tap.

The development upon the upland determines to a large extent the type of the adjacent water front structures. Three types are of greatest importance: (1) The commercial, providing for large manufacturing and shipping interests; (2) the residential, adapted to the location of beautiful homes and private estates; and (3) the recreational use of water frontages for park, boulevard and other recreational purposes.

Cities that are fortunate in also being ports should base their city plans upon the peculiar opportunity that the port affords. Mistakes in planning and development which exist at most of the older port cities of the United States should gradually be corrected, and new improvements undertaken with reference to a preconceived design.

The water front constitutes one of the chief features of any city located on navigable water. Therefore the proper correlation of water carriers with other forms of transportation is of the utmost importance. Both beauty and utility call for development in accordance with a plan that recognizes the need for unity. Experience teaches that development on the basis of unity is possible usually only where the policy of complete public ownership prevails.

25 View of part of New York water front and Statue of Liberty from the Woolworth Tower.

26 The water front of New York City from the Brooklyn side, showing the shipping and buildings of lower Manhattan.

27 View of the East River and the Brooklyn Bridge, New York.

32 The gateway for immigrants to America at Ellis Island, New York.

39 The Hudson River has great variety of scenery, some of the

finest being in the neighborhood of West Point, as shown in illustration.

48 The Erie Canal has been a source of commercial wealth to Buffalo and other cities located on its banks.

50 The water front of Niagara Falls and the Niagara River have made important contributions to both the wealth of the country and the pleasure of its people.

51 The Palisades of the Hudson are a form of natural scenery whose preservation depends upon public ownership and control.

52 Many of the docks of the great Trans-Atlantic liners are located in Hoboken, across the river from New York.

60 Atlantic City, N. J., is the most popular all-the-year-round seaside resort in the United States, with more than a million visitors yearly. The chief attractions are the beach, the Board Walk, the fine hotels, and the equable climate.

61 Pittsburgh owes its importance as an industrial city partly to its water front, and the means of communication which it furnishes.

99 Operations of the life-saving corps at the Jamestown Exposition.

100 Warships of the United States in Hampton Roads at the time of the Jamestown Exposition.

101 The water front at Harpers Ferry, West Va.

106 The Savannah River is given over to commercial development. It is one of the first ports on the Atlantic seaboard in the amount of cotton which it ships.

110 One of the terrors of our Southern rivers, as shown here at Palm Beach, a famous resort, is the dread of alligators.

111 The harbor of Key West, Florida, is an important sponge market.

119 New Orleans is a fair example of the many levees on the Mississippi River where cotton is one of the staple shipments.

120 The Delta of the Mississippi River, Louisiana, where pilots are taken on the large river steamers.

148 One of the great national problems is the prevention of floods, by far the most damaging being those caused by rivers. The view shows the common way of keeping the waters from spreading, the banks or dikes being made of bags of sand. A city plan should include preservation and protection of all flood channels.

154 Ship canal, Sault Ste. Marie, Michigan, providing for the greatest canal traffic in the world.

164 Part of the transportation system of the Great Lakes. Two Harbors, Minnesota, owes its importance to its heavy shipment of iron ore.

174 View of the Mississippi River at St. Louis, showing the great span of the Eads Bridge.

210 Lake formed by the construction of the Roosevelt Dam near Phoenix, Arizona, which backs up the Salt River for sixteen

miles, and holds enough water to flood over a million acres to a depth of one foot.

217 A view of Puget Sound, Washington, showing shipping of lumber.

242 View of the great bay and harbor of San Diego, with submarines in the foreground and battleships and torpedo boats beyond.

248 The bay of Panama with the city in the foreground, near the Pacific end of the Canal. One of the oldest cities in the Western world.

257 An interesting view of the harbor of San Juan, Porto Rico.

278 The harbor of St. John's, Newfoundland, the most important factor in the development of the city.

280 The harbor of Vera Cruz, the principal port of Mexico.

299 The bay of Santiago, Cuba. The harbor is a first class one, with very deep water and entirely landlocked.

304 Harbor of Bahia, Brazil, So. America, with a portion of the lower city in the foreground.

313 Harbor of Montevideo, Uruguay, So. America. Illustration shows dredging operation to deepen channel and make harbor navigable.

314 Entrance to harbor of Buenos Aires, Argentina, So. America. The Plata River is shallow, and dredges are kept constantly at work to keep the channels open.

326 The bay and city of Valparaiso, Chile.

347 The harbor of Liverpool, like many other great harbors of the world, has been made good mainly by the work of man. It is built on the broad mouth of the Mersey River, which is constantly dredged to keep a channel deep enough for the big liners.

374 Queenstown Harbor, Ireland, is the port of call for the city of Cork, fourteen miles away. The harbor is large and safe.

383 View of the River Spree in Berlin, Germany, with the Reichstag buildings located on its banks.

391 Moonlight on the Rhine at Bingen, Germany.

399 A view of the canal in Zaandam, Holland.

400 Fine steamer docks on the Rhine, Rotterdam, Holland, one of the world's great ports. Ship canals connect the city with the ocean.

405 Frederiksholms Canal in Copenhagen, with a good view of the building development along its banks. Note especially the museum of Thorwaldsen, the sculptor.

420 Harbor of Goteborg, Sweden. The business character of this port is indicated by conditions on the docks.

429 The new harbor and docks of Marseilles, France, large and well protected by a breakwater two miles long.

430 The Gulf of Napoule in the Riviera, showing Cannes, "a seaside paradise," on its warm banks.

432 A view of the Mediterranean and Monaco. The most widely known city of this principality is Monte Carlo, the famous gambling resort.

433 The harbor of Barcelona, which makes it the busiest city in Spain.
457 A view of the Grand Canal, Venice, which discharges its waters into the Adriatic Sea.
489 Interesting view of the Bosphorus toward the Black Sea from the heights above Scutari, Turkey in Asia.
501 The Ganges River before the Temple in Benares, India.
509 The Salwin River, Maulmain, Burma.
511 The harbor of Colombo, Ceylon, which has been largely made, a long breakwater being constructed to afford the necessary protection.
514 A busy seaport, Hong Kong, China, with a view of fishermen's houses.
515 The Yangtse River at Chinkiang, China, the third longest river system in the world. See 517.
517 Another view of the Yangtse River, and of the picturesque towns and villages which cluster densely on its banks.
518 A Chinese canal. A great deal of Chinese traffic is carried on by the canal system or on the river. The Grand Canal runs from Peking to Hangchow.
525 View of Fuji-Yama, Japan, from the water.
556 The harbor of Algiers, which is a natural bay protected by breakwaters. The port is equipped with modern machinery, railway switches, derricks, etc. as in Europe.
559 The Suez Canal, Egypt. It runs through level, sandy country, as shown in the view. Compare with the Panama Canal, 248 to 256.
569 The Great Dam of the Nile at the head of the first cataract of the Nile, six hundred miles above Cairo.
574 The port of Dar-es-Salaam on the coast of Africa, five hundred miles south of the Equator. Dar-es-Salaam is the capital of German East Africa. Note beauty of palm trees.
591 Hauroki Bay, showing the harbor of Auckland, New Zealand.

The stereographs or slides presenting more definitely views of docks and harbors are as follows: 25, 26, 32, 52, 106, 111, 119, 154, 217, 242, 267, 278, 280, 299, 304, 313, 314, 347, 374, 400, 420, 429, 433, 511, 556, 574, 591.

4. Parks and Playgrounds

Every city worthy of the name has public parks and playgrounds of some sort, and they are now recognized as a necessity of city life, a part of the city plan, just as streets and schools are. They contribute to the pleasure and health of urban populations more than any other recreative feature, and furnish the most necessary and valuable antidote to the artificiality, confusion, and feverishness of life in the cities. At the present time the value of parks and open spaces in towns and cities is very generally appreciated. It is recognized that such facilities as parks afford are not only desirable, but increasingly necessary; in fact, indispensable. In a vague way there is approval, too, of a large increase in both parks and playgrounds. But few even of the more

progressive communities appear yet to understand with any clearness that these open spaces in cities are of great variety; that they are, or should be selected and developed by experts to serve essentially different purposes, and that the failure to appreciate this fact and to keep it constantly in mind leads to great waste and inefficiency in our public grounds.

10 Common, Lexington, Mass. A good example of New England open space, usually reserved in the center of old towns.

28 City Hall Park, New York. A valuable breathing space in the great metropolis. It affords an excellent foreground to public and semi-public buildings.

31 Small parking spaces, even room simply for a few trees at street intersections in a large city, are decidedly worth while, as here illustrated.

39 The scenery of the Hudson is among the finest river scenery in the world.

49 The Falls of Niagara, and part of the State Park Reservation, are more frequented, probably, than any other small park in the United States.

50 The American Falls, Niagara, showing the beauty of their winter scenery.

51 Palisades of the Hudson River provide the most striking topographical feature of the Inter-State Parks of New York and New Jersey.

72 The general carnival represents a combination of wholesome play in an annual event of great beauty.

73 Culp's Hill, Gettysburg, an illustration of a military memorial park.

83 School gardens are one of the most practical forms of educational outdoor work combined with the zest of recreation.

90 All of the public buildings of Washington are surrounded with well planted open spaces and parks.

95 The Congressional Library, Washington, has a well designed environment.

126 The Alamo Plaza, San Antonio. Such plazas, with buildings round about them, are to be preferred to the more usual American method of putting public buildings in the center of open blocks.

191 The National Parks of the United States are the largest and most beautiful parks of any nation in the world. They are being made more and more accessible to visitors.

191 to 197 Yellowstone National Park, Wyoming. One of the most frequented National Parks.

201 Cathedral Spires, Garden of the Gods, near Manitou, Col. A place famed for its beauty and mineral springs.

207, 208 Grand Canyon. A place of indescribable beauty.

219 Crevasse of Paradise Glacier, Mount Rainier, National Park, Wash.

228, 229 Yosemite National Park, California.

290 Dancing in national costume is one of the favorite pastimes of Mexican people.
305 Park-like street in Rio de Janeiro, Brazil.
306 Children of illustrious Brazilian families.
312 Open space or plaza in Uruguay, typical of South American cities.
316 Palermo Park, Buenos Aires, with view of afternoon drive or parade, common in many places.
329 Plaza in the formal style in Arequipa. Harvard University has built an observatory near this place.
389 In almost every German city the important public buildings and the principal stores are arranged around open spaces which are usually parked, as here illustrated.
422 The principal boulevards of Paris, especially the Champs Elysees, are so constructed and planted as to become parkways leading from one important point in the city to another.
435 It is important for every city to have one or more well located open places to be used for fêtes, fairs, and other public celebrations.
455 The recreation of people in Southern Italy is confined largely to the public streets except on special holidays and Sundays, when they visit the more distant parks.
482 The advantage of ample open space around the government buildings at Petrograd is here well illustrated.
510 Burma. Every country has its picnic customs.
520 Chinese school children, Peking, China.
534 Japan is a fairyland of flowers, especially when the cherry trees are in bloom. The tea houses are always given a lovely setting.
535 Japanese gardens have their own style of picturesque design in which the question of scale is given special consideration. Beautiful results are secured in the smallest possible area.
588 Zoölogical Garden, Adelaide, Australia, combining scientific interest with outdoor recreation.

5. Public Buildings

Public buildings constitute an essential element in a city plan, and of first importance is their location with regard to the city as a whole. They may be grouped in one center, or in various centers, according to the plan of the city and the local requirements. They are usually rightly placed when grouped in locations that will suit economic conditions, and when they are readily accessible to the public.

The location of public buildings is bound up with the general structure of the city. This means especially the street system and the system of transportation, which is largely governed by the street system. While building groups may be advantageously placed on prominent streets in a rectangular system, or composed with principal intersections in the system of streets, yet for the more important groups the best location is at a focus of a number of streets.

7 Quincy Market and Faneuil Hall, Boston, Mass.
8 Old State House from Court Street, Boston, Mass.

28 Old and New City Halls and *World* Building, from City Hall Park, New York City.
80 The Old Liberty Bell, Independence Hall, Philadelphia, Pa.
87 The Capitol, Washington, D. C.
88 House of Representatives (Interior), Washington, D. C.
89 Supreme Court Room in the Capitol, Washington, D. C.
90 From War, State and Navy Building — White House — Treasury, Pennsylvania Avenue and Capitol, Washington, D. C.
91 The White House, Washington, D. C.
92 Annex to White House (Cabinet Room), Washington, D. C.
93 From Washington Monument east to Capitol over Agricultural Department grounds, Washington, D. C.
95 Congressional Library, Washington, D. C.
96 Washington's old home, Mt. Vernon, Va.
109 Old slave market, St. Augustine, Fla.
260 With the flag goes the public school — Royal School, Honolulu, Hawaii.
309 Municipal Theater, handsomest playhouse in the world, Sao Paulo, Brazil, So. Am.
315 The government buildings from the balcony of the Bourse, Buenos Aires, Argentina, So. Am.
324 Cathedral and Plaza. Women in native dress, Santiago, Chile, So. Am.
335 Famous Copacabana Church near Lake Titicaca, in Bolivia.
340 National university and halls of Congress, Caracas, Venezuela.
349 Tower of London, London, England.
350 Westminster Abbey, London, England.
351 The Bank of England, London, England.
352 The House of Lords, London, England.
354 Birthplace of William Shakespeare, Stratford-on-Avon, England.
355 Anne Hathaway's cottage, Shottery, England.
356 Shakespeare's Memorial Theater, Stratford-on-Avon, England.
360 An interesting glimpse of the old city of York with its cathedral, England.
362 Rydal Mount, home of poet Wordsworth, Lake District, England.
367 Historic Stirling Castle, Scotland.
376 Blarney Castle, Ireland.
383 The Reichstags-Gabaüde, Berlin, Germany.
384 Royal Palace, Berlin, Germany.
387 Market place and cathedral, Nuremburg, Germany.
405 Thorwoldsen Museum, Copenhagen, Denmark.
417 Royal Palace (Council Room), Stockholm, Sweden.
424 The Grand Opera, Paris, France.
425 Notre Dame, Paris, France.
436 Alhambra Palace, Granada, Spain.
382 Senate and the academy on the Vasali Island, Petrograd, Russia.
501 Temple, Benares, India.
502 The Taj Mahal, Agra, India.
503 The Jumma Mosque, Delhi, India.

582 City Hall, Cape Town, So. Africa.
587 Federal Parliament Building, Melbourne, Australia.

6. Residences and Homes

The variety of houses due to climate, wealth, education, work, habit, or other causes is here well illustrated.

9 Craigie House, Cambridge, Mass. Home of the poet Longfellow. A fine example of the Colonial style of architecture. The land opposite the house has been acquired as a public memorial park, thus keeping open forever the view of the house, and also the view from the house to the Charles River and Soldiers' Field beyond.

113 Cabin in which Abraham Lincoln was born, Hodgensville, Ky. A humble but well constructed log cabin. The Lincoln Farm Association has built over the cabin a beautiful Greek Temple.

205 Cliff Palace in the Mesa Verde, Col. Homes of the cliff-dwellers, the ancestors of our Pueblo Indians. Interesting architectural ruins.

249 Dwellings erected for employees of the old French Canal Company, Colon, Isthmus of Panama. Contrast the more recent dwellings constructed by the United States Government under the direction of such men as Gen. Goethals and Gen. Gorgas.

278 Picturesque and irregular quarters of fishermen in the harbor at St. John's, Newfoundland. These are similar to the homes which fishermen establish for themselves in New England and on other irregular shores.

281 Adobe hut, City of Mexico. Home of the peon, the peasant of Mexico, descendant of the Aztec. The adobe or sundried brick is in use widely as a suitable building material throughout the Southwest.

299 Simple but homogeneous character of homes in Santiago, Cuba, due to the uniform shape and material of the buildings and the harmony of the tiled roofs.

336 White houses with red tiled roofs in the best residence section of Guayaquil, Ecuador. Beauty of street view due to simplicity and harmony of buildings, the attractive balconies, and the occasional variety due to church spires.

338 The houses of La Guaira, Venezuela, fit the slopes of the hills. The city is small, and the population composed mostly of negroes, Indians, Spanish, and half-breeds.

354 Shakespeare's birthplace in Stratford-on-Avon, Eng., is a two-story house, typical of English village architecture, with a small garden back of it.

355 The Anne Hathaway Cottage at Shottery belongs now to Great Britain. The building is almost exactly as it was when Anne Hathaway lived there. Fine example of English farmhouse with heavy timbers and thick thatched roof.

362 The neat, mellow, vine-clad, characteristic English home of Wordsworth at Rydal Mount, England.

372 Room in which Robert Burns was born. House consisting of two rooms, now owned by the Burns Society of Ayr.

373 Peasant home in the Scottish Highlands. The walls of these peasant houses are made of stones or bricks, and the roofs are of thatch. Simple as they are, they are very pleasant to the eye. The walls are covered with vines, and each cottage has its garden.

389 The apartment houses in Strassburg, Germany, and in other German and Continental European cities, are the characteristic homes of the people. Compare with cottage homes in England.

402 Village homes in the Netherlands, with characteristic neatness, but no planting.

455 Picturesque street scene in tenement district, Palermo, Sicily. The Italians here seek the same sort of housing.

457 Beautiful Renaissance Italian homes on the Grand Canal, Venice, full of art and beauty. A fit environment of the civilization of the time.

514 The boat-homes of the Chinese in the river or sea towns. People are born in houseboats, and their fathers before them. These boats are much better to live in than are many of the land houses of the lower class of Chinese. The larger ones are 75 feet long and 15 feet wide. They usually have three rooms,—a hall room, a living room, and a sleeping room,—which are again broken up for use by means of screens.

526 The native skill of the Japanese is evidenced by their happy combination of use and beauty. This view of Tokio, the Japanese capital, shows the buildings close together, the houses low, and the roofs of heavy tile.

542 Homes of the Koreans. Note white robes of men even in winter, with snow on the roofs of the houses.

546 The "cascos" are the floating homes of many thousands in the Philippines. Compare with 514.

PART II

TYPES OF CITIES AND CITY LIFE

Cities generally owe their existence to geographic influences, and such individuality as they have is due largely to topography. The chief topographical characteristics determining cities are the harbors, rivers, hills and plains. It has taken decades of urban development and of mistakes to impress upon the cities of the United States the necessity to respect and conserve these natural forces, to which they owe not only their form but often their very life.

The classification of cities according to type or character may be conveniently considered under two heads: (1) Types distinguished by the size of the city; and (2) types distinguished by the dominant function of the city.

A. CLASSIFIED ACCORDING TO SIZE

1. Cities of 1,000,000 Population or More

25 to 31 New York; 80 to 84 Philadelphia; 139 Chicago; 314 to 316 Buenos Aires; 348 to 352 London; 383 to 385 Berlin; 421 to 425 Paris; 462, 463 Vienna; 472 to 474 Constantinople; 482 Petrograd; 500 Calcutta; 520 Peking; 526 Tokyo.

2. Cities of 500,000 to 1,000,000 Population

6 to 8 Boston; 61 Pittsburgh; 86 Baltimore; 152 Detroit; 174 St. Louis; 347 Liverpool; 386 Hamburg; 393 Cologne; 395 Brussels; 433 Barcelona; 435 Madrid; 454 Naples; 458 Milan; 464 Budapest; 485 Warsaw; 499 Madras; 513 Hong Kong; 517 Hankow; 520 Peking; 560 Cairo; 585 Sydney; 586 Melbourne.

3. Cities of 100,000 to 500,000 Population

9 Cambridge; 21 Providence; 41, 42 Syracuse; 48 Buffalo; 76 to 78 Scranton; 87 to 95 Washington; 116 Birmingham; 119 New Orleans; 167 Minneapolis; 220 Seattle; 230 San Francisco; 267 Montreal; 281 to 283 City of Mexico; 304 Bahia; 308, 309 Sao Paulo; 312, 313 Montevideo; 324 Santiago; 326, 327 Valparaiso; 365 Edinburgh; 380 Dublin; 381 Belfast; 387 Nuremberg; 389 Strassburg; 396 Antwerp; 400 Rotterdam; 404 to 406 Copenhagen; 416 Stockholm; 420 Goteborg; 450 to 452 Rome; 455 Palermo; 456 Florence; 461 Gratz; 475, 476 Athens; 492 Beirut; 493 Damascus; 501 Benares; 502 Agra; 503 Delhi; 504 Jaipur; 506 Srinagar; 515 Chinkiang; 516 Nanking; 521 Chifu; 556 Algiers; 557 Tunis; 588 Adelaide.

4. Cities of Less Than 100,000 Population

13 Gloucester, Mass.; 14 to 18 Lawrence, Mass.; 19, 20 Holyoke, Mass.; 37 Newburg on the Hudson; 49, 50 Niagara Falls, N. Y.; 52 Hoboken, N. J.; 60 Atlantic City, N. Y.; 106 Savannah, Ga.; 109 St. Augustine, Fla.; 122 Beaumont, Tex.; 126 San Antonio, Tex.; 128, 129 Conneaut, O.; 148 East St. Louis, Ill.; 149 Kalamazoo, Mich.; 154 Sault Ste. Marie, Mich.; 155, 156 Calumet, Mich.; 170, 171 Keokuk, Iowa; 176 Joplin, Mo.; 187 Butte, Mont.; 212 Salt Lake City, Utah; 213 Ogden, Utah; 242 San Diego, Cal.; 257 San Juan, P. R.; 260 Honolulu, Hawaii; 264 Quebec, Can.; 273 Winnipeg, Man.; 277 Vancouver, B. C.; 278 St. John's, Newfoundland; 280 Vera Cruz, Mex.; 299 Santiago, Cuba; 336 Guayaquil, Ecuador; 337 Barranquilla, Colombia; 338, 339 La Guaira, Venezuela; 340, 341 Caracas, Venezuela; 360 York, England; 392 Bonn, Germany; 397 Namur, Belgium; 399 Zaandam, Holland; 430 Cannes, France; 434 Burgos, Spain; 436 Granada, Spain; 442 Lucerne, Switzerland; 466 Serajevo, Bosnia; 468 Sofia, Bulgaria; 484 Nizhni Novgorod, Russia; 489 Scutari, Turkey; 495 Jerusalem, Pales-

tine; 509 Maulmain, Burma; 547 Manila, P. I.; 555 Tangier, Morocco; 573 Mombasa, Africa; 574 Dar-es-Salaam, Africa; 582 Cape Town, Africa; 590 Hobart, Tasmania; 591 Auckland, New Zealand.

5. Cities of Rapid Growth

A list of fifteen cities that have greatly increased in population, or grown up in an abnormally short time, as the result of some special circumstances such as industrial development, or popularity as a place of resort. The results of such sudden increase have not always been good, on account of the difficulty in providing adequate facilities, the increase of speculation, and the difficulty of getting proper attention to municipal problems at such times.

25, 26 New York City; 60 Atlantic City; 61 Pittsburgh; 116 Birmingham; 121 Oklahoma City; 131 to 133 Akron; 139 Chicago; 150 to 152 Detroit; 167 Minneapolis; 187 Butte; 220 Seattle; 230 San Francisco; 273 Winnipeg; 582 Cape Town; 585 Sydney.

B. CLASSIFIED ACCORDING TO DOMINANT FUNCTION

1. Capital Cities

This classification includes not only the great national capital cities, but also some examples of capitals of kingdoms, small principalities, and states. A state or section should show interest in its principal city when it is sufficiently unified to have a true consciousness of its own unity, to feel a pride in its own ideals and customs, and to possess a sense of its distinction from other parts of the country. This should be true of most American States, yet the state capitals, as cities, have not as a rule been developed in this way. In Europe the attitude of the people is quite different. The capital city of almost every kingdom, petty principality or dukedom, which corresponds much more closely to our state capital than to the national capital, is embellished with splendid palaces, spacious gardens, museums, wide streets and promenades, art galleries, fine sculpture, theaters and opera houses. Such embellishment has proved a source of new wealth, and it is well known that travelers spend millions of dollars and make long visits to these cities, thus justifying in another way the wisdom of this enlightened policy.

The list includes some places which were formerly capitals, because these places have still in their buildings, streets and parks the character of capital cities.

6 to 8 Boston; 87 to 95 Washington; 121 Oklahoma City; 248 Panama; 260 Honolulu; 264 Quebec; 273 Winnipeg; 305 Rio de Janeiro; 315 Buenos Aires; 324 Santiago, Chile; 340 Caracas; 348 to 352 London; 365 Edinburgh; 380 Dublin; 383 to 385 Berlin; 389 Strassburg; 395 Brussels; 404 Copenhagen; 416 Stockholm; 421 to 425 Paris; 432 Monaco; 435 Madrid; 450 to 452 Rome; 455 Palermo, Sicily; 460 Innsbruck, Austrian-Tyrol; 462, 463 Vienna; 464 Budapest; 466 Serajevo; 468

Sofia; 472 to 474 Constantinople; 475 Athens; 485 Warsaw; 493 Damascus, (long the capital of Syria); 495 Jerusalem (formerly Jewish capital); 503 Delhi, India; 504 Jaipur; 506 Srinigar, Kashmir; 511 Colombo, Ceylon; 526 Tokyo; 556 Algiers; 560 Cairo; 574 Dar-es-Salaam; 586, 587 Melbourne; 590 Hobart, Tasmania.

2. Resort Cities

Some cities have been built up principally about a resort, and have the features peculiar to their class. Sometimes they have been beautifully developed, but more often in the United States they have depended for their prestige and popularity upon climate, or some natural feature. They are certain to abound in hotels and in other provision for tourists.

This classification includes not only cities that are visited for health and recreation in a limited sense, but because of their "sights," and interest for tourists, especially in the case of American cities. Only a few of the European cities have been selected, yet nearly all of them could in one sense be classified as resorts which are visited by tourists.

6 to 10 Boston and vicinity; 26 to 30, 51 New York City and environs; 49, 50 Niagara Falls; 60 Atlantic City; 87 to 96 Washington; 110 Palm Beach; 291 Acatenango, Guatemala (winter resort); 354 Stratford-on-Avon, England; 391 Bingen on the Rhine, Germany; 421 to 424 Paris; 427 Chamonix, France; 430 Cannes, France ("a seaside paradise"); 442 Lucerne, Switzerland; 450 Rome; 456 Florence; 457 Venice; 459 Como; 460 Innsbruck, Austrian-Tyrol; 463 Vienna; 464 Budapest; 475 Athens; 502 Agra, India; 525, 526 Tokyo; 556 Algiers; 560 Cairo.

3. Financial Cities

The following cities are noted as centers of the world's finance. In most countries these are apt to be the governmental centers. In the United States the seat of government was intentionally separated from the city in which trade and commerce dominated.

25 to 30 (esp. 29) New York City; 84 Philadelphia Government Mint; 90, 94 Washington, D. C., Treasury building; 351 London, England; 383, 384 Berlin, Germany; 421 to 424 Paris, France; 463 Vienna, Austria; 482 Petrograd, Russia.

4. Cities Noted for One or Two Industries

Nearly all modern cities of any considerable size are industrial. In many cases they have been developed around one or two special industries. Sometimes these industries are the result of natural resources or advantages in location. At other times they have resulted mainly from the knowledge and initiative of individuals or industrial corporations.

13 Gloucester, Mass.— fisheries. 14 to 18 Lawrence, Mass.— textiles. 19, 20 Holyoke, Mass.— paper; 21 Providence, R. I.— jewelry;

22 to 24 South Manchester, Conn.— silk; 40 Troy, N. Y.— linen collars; 42 Syracuse, N. Y.— salt; 53 to 55 Paterson, N. J.— silk; 58, 59, Trenton, N. J.— porcelain; 61 Pittsburgh, Pa.— iron and steel; 74, 75 Hazelton, Pa.— coal; 76 to 78 Scranton, Pa.— coal; 82 Philadelphia, Pa.— locomotives; 86 Baltimore, Md.— oysters; 106 Savannah, Ga.— turpentine, cotton; 116 Birmingham, Ala.— iron and steel; 119 New Orleans, La.— cotton; 122 Beaumont, Tex.— oil; 128 Conneaut, O.— iron ore; 131 to 133 Akron, O.— rubber; 134, 135 Rossford, O.— glass; 140 to 144 Chicago, Ill.— packing houses; 149 Kalamazoo, Mich. — celery; 150 to 152 Detroit, Mich.— automobiles; 153 St. Clair, Mich.— salt; 155, 156 Calumet, Mich.— copper; 164 Two Harbors, Minn.— iron ore; 167 Minneapolis, Minn.— flour; 187 Butte, Mont.— copper; 220 Seattle, Wash.— shipbuilding; 257 San Juan, Porto Rico — coffee and cigars; 273 Winnipeg, Manitoba — agricultural products, flour; 295 Havana, Cuba — tobacco; 308 to 311 Sao Paulo, Brazil — coffee; 381 Belfast, Ireland — linen, shipbuilding; 432 Monaco, Monaco — Monte Carlo, gambling; 484 Novgorod, Russia — bells; 495 Jerusalem, Syria — olivewood, mother of pearl; 506 Srinagar, Kashmir — shawls, rugs; 512 Ratnapora, Ceylon — "The City of Gems," precious stones; 579 Johannesburg, S. Afr.— gold; 581 Kimberly, S. Afr.— diamonds.

5. Centers of Religious Interest

There is a tendency for religions to manifest unusual strength in special sections, or to become more dominant in particular cities. The following list illustrates this tendency.

6 Boston, Mass.— a center of Congregationalism, Unitarianism and Christian Science.

80 Philadelphia, Pa.— Society of Friends, both Orthodox and Hicksite.

212 Salt Lake City, Utah — Mormonism.

365 Edinburgh, Scotland — City of Knox and Presbyterianism.

450, 451 Rome, Italy — center of Roman Catholic Church.

472 Constantinople, Turkey — Mohammedanism, Turkish Sultan its head.

475 Athens, Greece — site of old Athenian shrines and Panathenaic procession.

482 Petrograd, Russia — center of Greek Catholic church.

483 Moscow, Russia — Kremlin, former center of Greek Catholic church.

495 Jerusalem, Syria — former Jewish capital, center of early Christian church.

501 Benares, India — sacred shrine of Brahman religion, also birthplace of Buddha.

502 Agra, India — Taj Mahal, temple and holy place of Mohammedans.

503 Delhi, India — holy place of Mohammedans.

560 Cairo, Egypt — center of Mohammedan education.

6. Coast Cities with Ports for Ocean Vessels

See notes on Waterways, Water Fronts and Harbors, and special comment on views under The Elements of City Plans, this classification.

7,8 Boston; 25 to 32 New York City; 52 Hoboken; 230 San Francisco; 242 San Diego; 248 Panama; 257 San Juan; 260 Honolulu; 277 Vancouver; 278 St. Johns, Newf.; 280 Vera Cruz; 295 Havana; 305, 307 Rio de Janeiro; 313 Montevideo; 314 Buenos Aires; 326 Valparaiso; 337 Barranquilla, Colombia; 338, 339 La Guaira, Venezuela; 347 Liverpool; 374 Queenstown; 380 Dublin; 381 Belfast; 404 to 406 Copenhagen; 416 Stockholm; 433 Barcelona; 454 Naples; 457 Venice; 472 to 474 Constantinople; 475 Athens; 499 Madras, India; 511 Colombo, Ceylon; 513, 514 Hong Kong; 526 Tokyo; 556 Algiers; 574 Dar-es-Salaam; 582 Cape Town.

7. Cities on Navigable Waters with Ports

See notes on Waterways, Water Fronts and Harbors, and special comment on views under The Elements of City Plans, this classification.

80 Philadelphia — Delaware R.; 106 Savannah — Savannah R.; 119 New Orleans — Mississippi R.; 170, 171 Keokuk — Mississippi R.; 174 St. Louis — Mississippi R.; 220 Seattle — Puget Sound; 264 Quebec — St. Lawrence R.; 267 Montreal — St. Lawrence R.; 277 Vancouver — St. of Georgia; 348 to 352 London — Thames R.; 386 Hamburg — Elbe R.; 396 Antwerp — Schelde R.; 400 Rotterdam — Rhine R.; 482 Petrograd — Neva R.; 500 Calcutta — Hooghly R.; 542, 543 Seoul, Chosen — Han R.

8. Inland Cities on Lakes and Rivers

9 Cambridge, Mass.— Charles R.; 48 Buffalo, N. Y.—Lake Erie; 49, 50 Niagara Falls, N. Y.— Niagara R.; 61 Pittsburgh, Pa. — Allegheny, Monongehela and Ohio rivers; 87, 90, 91 Washington, D. C.— Potomac R.; 128, 129 Conneaut, O.— Lake Erie; 139 Chicago, Ill.— Lake Michigan; 50 to 152 Detroit, Mich.— Detroit R.; 153 St. Clair, Mich.— St. Clair R.; 134 Sault Ste. Marie, Mich.—"Soo" Canal; 164 Two Harbors, Minn.— Lake Superior; 174 St. Louis, Mo.— Mississippi R.; 213 Ogden, Utah — Ogden and Weber rivers; 273 Winnipeg, Manitoba — Red and Assiniboine rivers; 360 York, England — Ouse R.; 383 to 385 Berlin, Germany — Spree R.; 387 Nuremburg, Germany — Pegnitz R.; 391 Bingen, Germany — Rhine R.; 393 Cologne, Germany — Rhine R.; 395 Brussels, Belgium — Senne R.; 397 Namur, Belgium — Meuse R.; 421 to 425 Paris, France — Seine R.; 435 Madrid, Spain — Manzanares R.; 442 Lucerne, Switzerland — Reuss R.; 450 to 452 Rome, Italy — Tiber R.; 460 Innsbruck, Austria — Inn R.; 462, 463 Vienna, Austria — Danube R.; 48 Moscow, Russia — Mosque R.; 501 Benares, India — Ganges R.; 502 Agra, India — Jumna R.; 503 Delhi, India — Jumna R.

ENGLISH

INTRODUCTION

By FRANKLIN THOMAS BAKER, Ph.D.

PROFESSOR OF THE ENGLISH LANGUAGE AND LITERATURE, TEACHERS COLLEGE, COLUMBIA UNIVERSITY

The trend of modern education has been steadily away from interest in mere words. This is the meaning of the great development in museums, shops and laboratories in the equipment of our schools. We have come to realize that merely to hear or read about a thing and even to be able to talk or write about it, is no guarantee that the thing itself is known and understood. In the case of material objects, really to know involves to see, and, if possible, to handle and to use. If he is to have even the foundations of an education, his range of concepts must include many things that are far removed from his immediate environment. If he lives in the great Mississippi Valley, for example, we try to help him gain some idea of the sea, of the great mountain peaks and ranges, of cataracts like Niagara, of lumbering in the forests of the North and East, of life and industry in the East, the South and the Far West. We count it necessary that he should picture to himself many of the scenes of historic or literary interest in Europe, the strange and teeming life of Asia, the uncouth and meager civilization of Africa. Since he cannot go to them we must somehow bring them to him. And here is where the miracle of pictures comes in.

Most of us feel that stereoscopic pictures give the illusion of reality better than flat pictures. The sense of distance, the size of mountains, the depths of precipices and valleys — as in the Grand Canyon — often seem incredible for the first time when viewed through the stereoscope.

How does all this apply to the study of English? In the first place, literature makes its appeal to the eye oftener than to any other sense. It presupposes in the reader a long record of seeing things. The shapes and colors of clouds and mountains, of flowers and birds and animals, the forms of

trees and the look of lakes and streams, the customs of strange peoples, the houses and streets of cities, the great centers of commerce with their wharves and depots,— all these are frequently assumed to be a part of the reader's stock of visual memories. And so the reader's grasp of the content is firmer, if the text recalls these memories.

But how if this assumption is mistaken and the reader has no such picture in his memory? Here the help of pictures is virtually a necessity. Think how little the pupil could get, unassisted, of a description of a cactus-covered desert. Though the appeal to the eye is far from being the only appeal that literature makes, it is so frequent as to be almost fundamental. The stereoscopic picture is the most vividly real of all photographs; therefore, with some satisfaction to our sense of the fitness of things we remember that the present convenient form of the stereoscope was invented by a man who combined the interests of science and literature, one of our best known American authors — Oliver Wendell Holmes.

The Keystone Series helpful as it is as an aid in reading literature, has an equally obvious value in teaching composition, oral and written. Something to say, something real, definite, interesting and detailed enough — this is the prerequisite to any profitable work in expression. One may get such material by reading and by being told. But he will get it still better if he can also see. The details in a picture or in a series of pictures on the same theme; the companion or contrasts of scenes and actions; — such assignments make excellent composition lessons. A friendly rivalry among the members of the class, to see which could find the most in a given picture, or to see which could recall the most pictures of a given sort, or to see which, in the judgment of his classmates, could give the best account of a picture,— such a contest would also be an excellent basis for a lesson in language.

The teacher will get the best results from these pictures: 1. If she learns to know the whole scenes so well herself that any opportunity of using them will come to her mind automatically. 2. If she makes a point of having the appropriate picture seen by the class, either through the stereoscope or on the screen while the interest is fresh. 3. If she encourages the habitual resort to the series by the pupils, just as she would encourage "browsing" in the library.

17. LITERARY SUBJECTS AND SETTINGS INCLUDING MYTHOLOGY

By FRANKLIN THOMAS BAKER, Ph.D.

PROFESSOR OF THE ENGLISH LANGUAGE AND LITERATURE, TEACHERS COLLEGE, COLUMBIA UNIVERSITY

A little inquiry into the exact nature of the images in children's minds will usually yield some startling discoveries. We shall be amazed not only at what isn't there, but at what is there in mistaken form. There is not only so much that they do not know, but they know so much that isn't so. Of course, we realize when we come to think it over, that it couldn't be otherwise. Their experience is limited, much of it is second-hand and faint or inaccurate in the impression it leaves, and they have had as yet but a short period for correcting their impressions either by reflection or by checking them up through further impressions.

In teaching literature we find constant need of helping the children to fill in and correct the images that are commonly referred to in the poems and stories they read. We must be careful about what we take for granted. How many children there are who have never seen the ocean, or a mountain, or a forest, or a great city! How very few who have any image of the Parthenon, or Westminster Abbey, or Notre Dame. How few who have any lively conception of any kind of life outside their immediate environment!

One of the values of literature is that it does enlarge the bounds of our minds through vicarious experience. But for many experiences the literature alone is not enough. Pictures are needed to help us build up the images. Through pictures and poems and stories of the sea, an inland boy often gets so good an idea of the sea that when he comes to it for the first time, he finds it just as he expected it to look. And if he never sees it, he may yet have some notion of what it is like.

The 600 pictures in this series have, quite properly, been selected mainly for their geographical value. Few of them are

only literary in their interest. But yet, as will be seen from the selections that follow, a very large number of them may help in explaining references and pictures in literature and in making it interesting.

The teacher must use her own judgment as to the plan of using them. Sometimes it may be best to show the pictures before the reading, sometimes after it. She will need to discriminate between what explains, as for example, the Pocahontas picture, or the Turpentine Gathering, and what merely adds interest and reality as, for example, The Old North Church and Washington's Home. The former kind might be shown before the reading, the latter after it.

The best use of these views is probably that made by the pupils on their own initiative. If the pictures stand in the room, free to the pupils in their free hours, they will go to them again and again, and come to know them in the thorough way that is possible only through repeated use.

HIAWATHA — A SAMPLE LESSON

The lesson is on Hiawatha's Childhood, beginning —

"By the shores of Gitche-Geemee,
By the shining Big-Sea-Water,"

and ending with the line,

"Called them Hiawatha's Brothers."

INTRODUCTION BY THE TEACHER

This introduction will explain briefly and clearly that Hiawatha was the hero of an Indian tribe on the shores of Lake Superior (pointed to on a map), which the Indians called Gitche-Geemee, meaning Big-Sea-Water; that Hiawatha was good and wise, and learned many things that helped his tribe — to catch fish, to make a canoe, to write letters by pictures, to grow corn, etc.

He lived in a wigwam. What is a wigwam? Here let the children see picture 263. Tell them that these Indians are looking out over the St. Lawrence River, but they may make-believe it is Lake Superior. Don't hurry them. Lead them to see what the Indians there are doing, — weaving baskets. A little exchange of experience about Indian wares — not too long drawn out — will be very helpful.

The class may now read the first ten lines. What parts of the lines were shown in the picture? Were the pine trees and the firs shown?

Read the next twelve lines. Do they see the babe in his cradle? Have they ever seen a cradle? An Indian baby's cradle? Now show picture 158. Do they note that it is at the base of a huge tree?

(The song, The Naked Bear, has been printed by several people. A version simplified for schools may be had by writing to The Macmillan Co.— The Little Owlet song is issued by several music publishers.)

Read the next twelve lines. Who has seen a comet? Show picture 600. Wouldn't it be likely to set these simple-minded folk wondering?

"Warriors with their plumes and war-clubs." What did Indian warriors look like? Show pictures 168 and 182.

Explain the reference to the "northern lights."

As the rest of the lesson is read, explain such things as the speaking of the water and the pine tree, etc.

The line "How the Dakota built their lodges," will naturally call out picture 196, and the reference to the reindeer picture 413.

Such reinforcement of the intuitive basis must not, however, be allowed to smother the main idea of the selection: Hiawatha learning the secrets of nature from his old grandmother, Nokomis.

JOSEPH ADDISON

The Spectator

350 Westminster Abbey.
593 to 600 "The spacious firmament on high."

ANTI-SLAVERY POEMS

101 Harpers Ferry, "John Brown's body lies a-moldering in the grave."
109 Old slave market.
105, 107, 117, 118, 119 Types of negroes.
570, 572, 578 Negroes in Africa.

BIBLICAL SCENES

491 Tarsus, the city from which Paul came.
493 Damascus, said to be the oldest city in the world. The Bible refers often to life "on the house tops."
495 Jerusalem, from the Mount of Olives. In many ways, ancient Jerusalem looked the same as this.
496 The Road to Jericho, where the Good Samaritan found the man who had fallen among thieves.
497 The old Hebrew law forbade the muzzling of an ox while threshing.
498 "Two women shall be grinding corn. The one shall be taken, the other left."
561 to 565 "Out of the land of Egypt, out of the house of bondage." No doubt Moses saw things very like these.

WILLIAM CULLEN BRYANT

30 **The Crowded Street.**
1, 162, 195, 224, 229 **The Forest Hymn.**
2, 72, 102, 198 **The Gladness of Nature.**
44, 175 **The Planting of the Apple Tree.**

Bannockburn.
368 **"Scots wha hae wi' Wallace bled."**
372, 373 **The Cotter's Saturday Night. The Brigs of My Heart 's in the Highlands. Auld Lang Syn**

JOHN BURROUGHS

175, 44 **The Apple.**
359 **Tragedies of the Nests.**
1 **A Taste for Maine Birch.**

LORD BYRON

The Siege of Corinth

477 Excavators at work at Old Corinth.

Childe Harold's Pilgrimage

450 Rome, The Eternal City (canto IV, stanza 78).
451 The Tiber (canto IV, stanza 79).
452 Coliseum, the King of Ruins (canto IV, stanzas 128,
457 The Grand Canal, Venice, Italy (canto IV, stanza 1
475 Athens and the Acropolis (canto II).

JAMES FENNIMORE COOPER

The Spy

37 Washington's headquarters at Newburgh, N. Y.

MARY MAPES DODGE

Hans Brinker

9 Streets in Zaandam, Holland.
0 Docks in Rotterdam.
2 Scene in a Dutch village.

207, 208 Descending the Grand Canyon.
232 Buffalo. The lazy lucky Indian.
243 to 246 Adventures in Alaska.

JOEL CHANDLER HARRIS

Uncle Remus Stories

105 Hoeing rice, South Carolina. Mr. Harris got his stories from the southern negroes.
107 Turpentine farm near Savannah, Ga.
117 Picking cotton. A good view of the southern negro in a well-known situation.
118 Harvesting peanuts, Marianna, Ark.

NATHANIEL HAWTHORNE

Niagara Falls

49 Summer view of the Falls.
50 Winter view of the Falls.

WASHINGTON IRVING

Sketch Book

350 Westminster Abbey.
38 Hudson River Valley. What Rip Van Winkle saw when he woke from his long sleep.
51 The Palisades of the Hudson, looking north.
36 The cemetery at Sleepy Hollow, near Tarrytown, N. Y. Irving is buried here.

Stories from the Alhambra.

436 Exterior of Alhambra Palace.

Astoria

226 Columbia River, Ore.

HELEN HUNT JACKSON

Ramona

241 San Gabriel Mission, California.

RUDYARD KIPLING

Captains Courageous

52 An ocean liner such as Harvey started on.
13 Drying codfish in the sun, Gloucester, Mass.

Just So Stories

577 How the Rhinoceros Got His Skin.
588 Old Man Kangaroo.
505, 509 The Elephant's Child. (110 An alligator is very like a crocodile.)
565 How the Camel Got His Hump.

Moti Guy, Mutineer; and Toomai of the Elephants

505 Elephants on parade.
509 Elephants at work.

Kim

499 to 508 India, its life described in Kim.

LUCY LARCOM

Hanna Binding Shoes

41 Shoe factory. Lucy Larcom herself worked in a shoe factory in Lowell, Mass.

If I Were a Sunbeam

72 Children in sunshine.

ABRAHAM LINCOLN

113 Lincoln's birthplace, Hodgeville, Ky.
73 **Gettysburg Oration.**

87 **Inaugural Address.**

HENRY WADSWORTH LONGFELLOW

9 Longfellow's home, Cambridge, Mass. In this old house stood **"The Old Clock on the Stair."**

Paul Revere's Ride

6 Old North Church, Boston, where the signal light was hung.
7 Quincy Market and Faneuil Hall, Boston, where Paul Revere often attended meetings.
10 Lexington, Mass. The minute men roused by Paul Revere fought the Battle of Lexington.

Evangeline

262 "In the Acadian Land, on the shore of the Basin of Minas." Nova Scotia, Canada.

Courtship of Miles Standish

409 Spinning wheel such as Priscilla used.

The Ropewalk

553 Manila hemp industry.

The Children

72 "In your hearts are the birds and sunshine."

Hiawatha

158 The Indian infant.
168 Indians receiving guests.
169 Indian man and girl in canoe.
263 Indians weaving baskets.

184 The feast of Mondamin.
189 Hiawatha hunting.

JAMES RUSSELL LOWELL

Vision of Sir Launfal

72, 102, 38 "And what is so rare as a day in June?"
428, 448 "Down swept the chill wind from the mountain peak, From the snow five thousand summers old."

OUIDA

Dog of Flanders

398 Belgian draft horses.

Nuremburg Stove

387 Old Nuremburg.

PATRIOTIC LITERATURE

10 Monument to Minute Men, Lexington.
80 Old Liberty Bell, Philadelphia.
87 The Capitol, Washington.
91 The White House, Washington.
96 Washington's home, Mount Vernon.
242 Submarines, battleships, torpedo boats, San Diego, Cal.
254 The battleship *Missouri*.
100 Battleships at Hampton Roads.

WILLIAM PRESCOTT

Conquest of Peru

331 The Incas.

Conquest of Mexico

282 to 285, 288 The Aztecs.

MRS. NORTON

Bingen on the Rhine

391 Moonlight on the Rhine, or Bingen. (**Bishop Hatto's Tower**, by Southey, and Longfellow's **Children's Hour** will be remembered here.)

ROOSEVELT AND LODGE

Hero Tales from American History

96, 9, 37, 29 Washington, by H. C. Lodge.
119, 120 Battle of New Orleans, T. Roosevelt.
126 Remember the Alamo, T. Roosevelt.
100 Hampton Roads, T. Roosevelt.
73 Charge at Gettysburg, T. Roosevelt.
113, 73, 91 Lincoln, H. C. Lodge.

WALTER SCOTT

The Lady of the Lake and other stories of Scotland.

365 The famous monument to Scott, on Princess St., Edinburgh (pronounced Ed-in-bur-ro).

366 Highlanders in costume; as described in The Lady of the Lake.

367 Stirling Castle. The residence of the Kings of Scotland; mentioned in The Lady of the Lake, canto VI, st. XXVIII.

369 Ellen's Isle, Loch Katrine. In The Trossachs (or "bristled country"), near Edinburgh. Made famous by The Lady of the Lake.

The Talisman

495 Jerusalem, to regain which city the Crusades were made.

496 The Jericho Road often traveled by Crusaders.

497, 498 Scenes in Palestine.

494 A Sheik showing dress of the Saracen.

Kenilworth

348 London Bridge.

352 The House of Lords, London, Eng.

WILLIAM SHAKESPEARE

354 His birthplace, Stratford.

355 Anne Hathaway's cottage.

356 Memorial theater in Shakespeare's honor at Stratford.

382 **Sea Dirge.**

SAMUEL FRANCIS SMITH

America

See classification on Reading.

1, 2, 6, 7, 8, 10, 25, 38, 61, 71, 72, 87, 88, 90, 91, 93, 110, 117, 127, 178, 182, 188, 190, 198, 207, 208, 215, 221, 224, 242. "My Country 'tis of thee." Let children see that all the country, far and wide with its diversified life is "my country."

51, 197, 228 "I love thy rocks and rills."

1, 102, 224, 229 "Thy woods and templed hills."

51, 207, 228 "Let rocks their silence break."

ROBERT LOUIS STEVENSON

Inland Voyage

396 A scene on the streets of Antwerp. From the docks of this city Stevenson and his friend set off in their canoes for their trip through Belgium into France.

397 The river Meuse and Namur have been made by the war almost as famous as Antwerp.

ALFRED TENNYSON

Bugle Song

377 Lakes of Killarney. These are the lakes celebrated in Tennyson's Bugle Song.

The Brook

363 A wooded glen in Wales.

J. T. TROWBRIDGE

138, 159, 165 **Farm-yard Song.**
426 **Darius Green.**

CHARLES DUDLEY WARNER

Being a Boy

130 The sugar camp.

STORIES OF GEORGE WASHINGTON

96 Washington's home. Stories of his home life.
61 Confluence of Allegheny and Monongahela Rivers. Story of Fort Necessity and Braddock's defeat.
9 Longfellow's home. Washington taking charge of the American army at Boston.
37 Washington's headquarters at Newburg. Washington's refusal to think of being a king and his farewell to his army.
29 Wall St. Washington as President.

JOHN GREENLEAF WHITTIER

The Corn Song and The Huskers

184 The corn that Whittier knew was the shorter kind grown in New England.
136 "There wrought the busy harvesters."

The Pumpkin

137 "O, fruit loved of boyhood."

The Barefoot Boy

488 "Barefoot boy with cheek of tan."

WILLIAM WORDSWORTH

361 Lake Grasmere and village. Wordsworth's home during his early residence in the Lake District.
362 Rydal Mount, the later residence of Wordsworth.
72 **To the Daisy.**
359 **The Nightingale.**

SPYRI

Heidi

445 A Swiss cottage in the Alps. The one in which Heidi and her grandfather lived was humbler and smaller than this.
441 On the top of a mountain.
444 A Swiss valley.
447 A Swiss village.
448 A famous Swiss mountain peak.
449 Some Swiss roads.

MISCELLANEOUS

342, 346 **Among the Icebergs,** Dana.
452 **Androclus and the Lion.**
494 **The Arab's Farewell to His Steed,** Caroline E. S. Norton.
484 **The Bells,** Edgar Allen Poe.
375 **The Bells of Shandon,** Francis Sylvester Mahony.
450, 452 **Ben Hur.** Gen. Lew Wallace.
73 Gettysburg. 114 Lookout Mt. **The Blue and the Gray.** Frances M. French.
243, 246 **The Call of the Wild,** Jack London.
513, 515, 519 Chinese Stories such as **The Poet Li** or **Woo of Hwangho.**
38, 451 **The Cloud,** Percy Bysshe Shelley.
99 **The Coast Guard,** Emily Huntingdon Miller.
27 **Crossing Brooklyn Ferry,** Walt Whitman.
415 **The Cruise of the Cachalot,** Bullen.
98, 158, 168, 169, 182, 204, 244 **Customs of American Indians,** Lewis and Clarke.
359 **Don't Kill the Birds,** Colesworthy.
376 **The Goves of Blarney,** Frances Sylvester Mahony.
282, 369, 38, 39 **Great, Wide, Beautiful, Wonderful World.**
264, 265, 266 **The Heights of Abraham,** Parkman.
451 **Horatius at the Bridge,** Macauley.
10, 130 **How the Leaves Came Down,** Susan Coolidge.
98, 158, 168, 169, 182, 204, 244, 263, 265, 328 Indian folk stories.
50 **Jack Frost,** Miss Gould.
594, 595 **Lady Moon,** Lord Houghton.
71 Lake Erie and Commodore Perry.
32 **The Making of an American,** Jacob Riis.
88, 242, 260 **The Name of Old Glory,** James Whitcomb Riley.
359 **Ode to the Nightingale,** Keats.
241 San Gabriel Mission, **The Angelus,** Bret Harte.
246 **Stickeen, A Dog Story,** John Muir.
264, 39 Story of Benedict Arnold.
98 Story of Pocahontas.
441, 444, 445, 446 to 448 **Tell, to His Native Mountains.**
10 **The Tree,** Bjornson.
415 **Two Years Before the Mast,** Dana.

415 **The Typee,** Melville.
109, 117, 119 **Uncle Tom's Cabin,** Harriet Beecher Stowe.
137 **When the Frost is on the Pumpkin,** James W. Riley.
71, 10, 224 **Woodman, Spare that Tree.**
178, 179, 72 **Work,** Cary.

SONGS

366 **The Bluebells of Scotland.**
117 **Dixie Land,** D. Emmett.
38, 373 **Home Sweet Home,** John Howard Payne.
347 to 361 **Isle of Beauty,** T. H. Bayly.
495 **Jerusalem,** Bishop Reginald Heber.
377 **Killarney,** J. W. Balfe.
348 **London Bridge,** F. E. Weatherby.
429 **Marseillaise,** Roget de L'Isle.
511 **The Missionary Hymn,** Bishop Reginald Heber.
382 **The Song of the Sea,** B. W. Procter.
88, 242, 260 **The Star Spangled Banner,** Frances Scott Key.
391, 392 **The Watch on the Rhine,** Max Schneckenburger.

MYTHOLOGY

The mythology of the ancient people, especially the Greeks, the Romans and the Scandinavians, was a nature worship. The primitive men took the forces of nature which influenced their lives and against which they were powerless and personified them, made them into deities. The gods and goddesses were not at all perfect; they were only men and women of a larger size and more powerful, yet with all the weaknesses and foibles that belong to humanity.

The primitive man looked about and saw the changing face of nature (480); they saw that even the best works of man are destroyed in long ages (478) and they personified time in Cronos or Saturn, an old, old man with white beard and hourglass. They told us that Cronos devoured his children. Look at (477, 568) and tell what they meant.

Next, man looked at land (479) and sea as in (432); they saw the clouds (451, 452) bringing rain with thunder and lightning; they vaguely realized law and order and so they invented a supreme being, the father of Gods and men, whom all must obey. The Greeks called him Zeus; the Romans, Jupiter; the Scandinavians, Woden.

The Temple of Zeus (478) was at Olympia, where were held the Olympic games. Here was the gold and ivory statue of Zeus carved by Phidias, so imposing that it was called one of the seven wonders of the ancient world.

From early days marriage and motherhood (471) have been considered the most sacred relations of mankind. This was personified in Hera, or Juno, queen of heaven, wife of Jupiter, who watched over marriage and mothers (455).

Pallas Athena, or Minerva, whose temple, the Parthenon (475), was the chief ornament of the Acropolis, was the goddess of wisdom, of skilled labor and of war. She sprang from the head of Zeus fully armed. Can you explain why? The olive tree (495) was her gift.

Aphrodite, or Venus, goddess of beauty and of love, was born from a piece of sea foam (382). Flowers sprang up wherever she stepped (444), and shepherds sacrificed to her for increase of their flocks.

The sea, changeful and treacherous (432, 382, 414, 415), so often destroying their small and frail boats, was Poseidon, or Neptune, who rode in a chariot drawn by dolphins and held a trident. All seamen offered sacrifices to Neptune. Each river (391) had its own river god, all of whom were under the dominion of Neptune.

Hephæstus, or Vulcan, was the worker in metals. Down in the bowels of the earth (453) he worked, and the smoke of his forge came from the mountains (300). He made the first plowshare (488) and the first sword (385, 426).

The sun (593, 414) so bright and beautiful, bringing light (451) and health and growth (480), was named Apollo, god of light, of music and of medicine. He was always represented as a beautiful young man. While exiled from Olympus, he tended the sheep of Admetus disguised as a shepherd (480).

The moon (594, 595) with its milder silvery light (391) was Diana, goddess of pure young girls and of the chase (2, 189). She was always a lovely maiden with bow and quiver and a fawn near by.

The ancients knew war, cruel and destructive (385, 426). So they made Ares, or Mars, god of war, big and strong and cruel and somewhat of a coward.

Pluto, the god of the underworld, ruled over the dead. His were the mines (76, 155) and minerals (579, 581); and so he became the god of riches. Today men who are very rich are called plutocrats.

Hermes, or Mercury, the messenger of the gods, rode on the wind (451, 478). He was always represented as a slender youth with wings on cap, shoulders and feet. He is thus described in Hawthorne's story "The Miraculous Pitcher."

The people might plow and sow and reap, but unless the heavens were kind, all their work was nothing. So they made Demeter, or Ceres, goddess of golden grain and of harvests (199, 479). She is always a stately woman with a sheaf of grain and horn of plenty.

Her daughter Persephone, or Proserpina, is the wife of Pluto. Six months she is down in the realms of death and the world is cold and barren (50). Six months she is with her mother and the world smiles, rivers flow and plants grow and bloom (444). See Hawthorne's story "The Pomegranate Seeds."

Bacchus, or Dionysius, was the god of the vine and of wine (236, 390).

Hercules, the Greek hero, killed the Hydra on the Argive Plain (480). Here, too, he fought the Nemean Lion. While on his way to get the herds of Geryon and bring them to Argos, he split the Rock of

Gibraltar (439), letting the Atlantic join the Meditterranean. With the Argonauts he sailed through the Bosporus (489).

The Cyclops were giants, children of Uranus, the sky, and Gæa, the earth (479, 480). Each had one eye in the middle of his forehead. They forged the thunderbolts of Zeus. Volcanoes (300, 453, 525, 548) were the chimneys of the shop where they labored under the direction of Vulcan.

Through the Bosporus Strait (489) sailed the Argonauts, led by Jason, in their search for "the golden fleece"; and across it fled Io in the form of a heifer chased by the gadfly.

Bellerophon, who captured Pegasus, was a hero of the Old Corinth (477).

The Argive Plain (480) was the home of Io, and of Danaus and his fifty daughters. Danaus first dug wells in Argos.

The Hyperboreans were a mythological people who lived in a land of everlasting day and perpetual spring, where sorrow and old age never came. It was far to the north, beyond the north wind (414).

Romulus while a baby was set adrift on the Tiber River (451) by his uncle, Amulius. Rescued and reared by a shepherd, he became the founder of Rome (450, 452).

The Scandinavians personified the cold and frost (408, 409) as malicious giants against whom the friendly gods Woden and Thor were ever in conflict. This was a representation of the difficulties which the people had to overcome. This struggle is very clearly shown in view 408.

Woden, or Odin, was the supreme deity of the later Norse mythology. He was a god of agriculture (408) as well as of wisdom and poetry. He was sometimes worshiped as the sun god (414).

Thor, the thunderer, was the terror of the giants of the ice and cold (408, 409), with whom he was constantly at strife. He was always in the vigor of youth, and had a red beard and was the strongest of all gods. Why would the thunderer be the terror of the giants?

Frey or Freyr is the Scandinavian god of peace and fruitfulness (408). To him were addressed prayers for a good harvest. He wakened the earth from the sleep of winter (407) and dispensed golden sunshine (414) and summer showers.

Frigg or Frigga, the wife of Odin or Woden, was the goddess of the sky (593 to 600). She presided over marriage and domestic life (411, 410, 409). The constellation of Orion (599) was known as Frigga's distaff (409). Friday was named for her.

Freya or Freyja was the Scandinavian goddess of love and beauty (418). She was supposed to be the sister of Frigga and later was worshipped in place of Frigga.

The ancient mythology comes to us in many ways. The worship of the sun (414), the moon (391, 594, 595), of Woden and Thor, Frigga and Saturn gave us the names of the week. The stars still bear the names of the gods given them thousands of years ago. Mars (596), the god of war, and Saturn (597), still shine for us as they did for

Homer. When Uranus was discovered in 1781, the old mythological name was given to it.

Orion (599), one of the brightest and most easily distinguished of our constellations, was known to Job, and was mentioned by Homer about 3000 years ago. Orion was a great hunter set in the sky by Artemis. There is a multitude of legend about him. The Scandinavians called this same constellation the distaff of Frigga.

18. ENGLISH COMPOSITION

By JAMES FLEMING HOSIC, Ph.M.

EDITOR OF "ENGLISH JOURNAL," HEAD OF ENGLISH DEPT. IN CHICAGO NORMAL SCHOOL

Success in teaching children to speak and write English depends chiefly upon two things, good sense in assignments and emphasis upon one difficulty of form at a time. A proper assignment arouses in the pupil a desire either to entertain, inform, or persuade the members of his class and to gather together the material for the chosen purpose.

It is here that stereographs and lantern slides are found distinctly helpful. They visualize the topic, they suggest possibilities, provide material, and open the way to investigation. Not only so; they also assist the young speaker in presenting his ideas by providing a focus of attention and by illustrating his points. Most important perhaps is the arousing of the pupil's interest so that he puts his energies into the work. The principal of a large city school was addressing a group of teachers in a neighboring city on the topic of visualizing school work. Being asked what influence his Keystone Set of stereographs and slides had on his dull pupils, he replied that after he had used the set he had no dull pupils. He stated that the so-called dull pupil was usually one who lacked interest in his work or who had difficulty in getting knowledge from the printed page. The stereographs aroused an intense interest and the picture gave him the facts quickly. Having something definite to tell, he was just as eager to tell it as were the others.

In using the "600 Set" to assist his class to grow in power of English expression, the teacher should bear in mind that composition is a process involved in all subjects, particularly in the study and class discussion of geography, history, and literature. To a considerable extent, therefore, his most effective employment of the pictures for English work will consist in directing a fuller and more orderly presentation of ideas

s suitable for the history or geography class, and the composition class should provide for instructing outlines, writing clear sentences, and similar necessary technique. Often a study begun as geogwisely be concluded as composition. In all classes should be judiciously corrected as made, though acrifice of the train of thought being followed, the o train the pupils in habits of correct English.

l classification of composition topics according to of rhetoric is worse than useless for purposes of composition. Children cannot speak or write efhen burdened with the consciousness of a *form* to ed. What they need is consciousness of a real auof something definite which they wish to do for ce. Hence the suggestions which follow have been a series of possibilities for interesting class work possibilities will readily suggest themselves to anyegins to follow out those here put down. There no attempt to develop organization in a series of agraphs below the fifth grade.

GIVING ACCURATE INFORMATION

a large number of the scenes convey geographical ation. To put this into words requires care as to clear and sequence. If only the stereographs are available

Airplane 426; Agriculture 47, 105, 108, 136, 178, 181; Animals and birds 2, 110, 111, 359, 509; Bank of England 351; Cities 27, 28, 90, 61, 8, 139, 167, 230, 248, 282, 340, 421, 432, 450, 457, 475, 558; Dairy cattle 57; 159, 165, 339, 356, 364, 371, 403; Fishing 13, 86, 97, 415, 481, 226, 227, 244; Glaciers 219, 274, 275, 276, 342, 408, 427, 428, 446, 448; Harbors 25, 52, 106, 242, 277, 278, 280, 299, 304, 307, 313, 314, 326, 338, 347, 374, 386, 420, 429, 430, 433, 473, 492, 511, 514, 556, 591; History and Literature (American) 6 to 10, 25, 37, 39, 71, 80, 87, 88, 61, 91, 95, 96, 101, 109, 205, 243, 248 to 256, 296; (European) 349, 350, 354, 355, 362, 367, 372, 376, 425, 436, 439, 450, 451 to 458, 462 to 464, 466, 470, 472, 475, 477, 478, 482, 483, 485; (Asiatic) 493, 495, 497, 500, 501, 502, 503, 524, 527, 547; (African) 558, 559, 564 to 568; Immigration 32; Interesting sights 49, 100, 382, 415, 453, 524; Industries, Misc., 103, 112, 443, 536, 541, 44, 107, 573; Irrigation 104, 105, 210, 515, 527, 528, 530, 549, 564, 569; Lumbering 1, 162, 216, 217, 224; Manufacturing 11, 12, 16, 20, 21, 24, 35, 40, 41, 42, 59, 62 to 68, 84, 94, 116, 412; Mining 70, 74, 75, 76, 77, 115, 155, 581; Midnight sun 414; Regulator of world's clocks 353; Stock raising 127, 185, 186, 301, 317, 358; Submarine 242; Transportation 43, 48, 253, 575, 580; Zeppelin 394. For additional subjects see Index.

Consider particularly the possibility of orderly *explanation of the processes* shown in the following: Almonds 234; Automobiles 150, 151; Bananas 294; Bark cloth 570; Basket weaving 263; Bread making 410, 292; Butter 45; Charcoal 103; Coal 74 to 79, 129; Coconuts 551; Coffee 302, 310, 311; Coke 68; Copper 155, 156, 157; Corn 184, 136, 137, 160; Cotton 117, 124, 125, 119, 14, 15, 16; Diamonds 581; Dredging 313; Electric power 170, 171; Ferry boats 507; Farm machinery 181, 180, 179, 178, 166, 161; Fish 244, 226, 227; Glass 134, 135; Granite 3; Hemp 552, 553; Hogs 183, 172; Houseboats 546, 514; Hydraulic mining 225; Iron 163, 62, 63, 64; Ivory 573; Leather 272, 11, 12, 41; Making money 84, 94; Marble 4, 5; Markets, 7, 111, 387, 393, 395, 423, 447, 466, 469, 481, 485, 555, 572; Milk 57, 46; Nile River 564; Oil 122, 69, 70, 123; Oysters 86, 97; Packing houses 141 to 144; Paper 19, 20, 412; Paper money 94; Pineapples 108; Pottery 58, 59, 487, 542; Rice 104, 105, 528, 529, 549, 550; Rubber 131, 132, 133; Salt 42, 153, 518; Sardines 531; School children 83, 260 465, 520, 306; Silk 536 to 541, 53 to 55, 22 to 24; Steel 65 to 67; Sugar 130, 198, 333, 258, 270, 271, 419, 34, 35; Suez Canal 559; Tea 530; Tobacco 297, 112; Transportation 509, 449; Wheat 199, 177, 218; Wool 190, 17, 18, 81. For additional subjects see classification Production and Manufacturing.

COMPARATIVE AND GENERAL STUDIES

Older pupils may occasionally bring together sets of scenes which present striking contrasts or suggest modest generalizations. Projects of this sort involve much more thinking than ordinary accounts of facts and require correspondingly more mature powers of expression. They are, of course, all the more educative for this reason. Note for example the following:

Engineering feats 27, 170, 171, 174, 210, 253, 250, 256, 330, 366, 440, 441, 444, 569, 575; How machinery helps 14, 18, 24, 45, 46, 78, 79, 81,

ll subjects see Index.

STUDIES OF VOCATIONS

ow agreed that older children should learn a great dea
occupations before the time comes to choose one. Th
ll enable the class to center attention upon each of t

ng, 46, 45, 57, 159, 165; Engineering 27, 170, 171, 174, 2
254, 256, 154, 210, 559, 569; Farming 178, 179, 180, 177, 1
137, 160, 184, 147, 166, 181, 104, 105, 112, 297, 117, 198, 2
13, 86, 97, 226, 227, 244; Fruit raising 44, 85, 108, 175, 2
294; Lumbering 1, 162, 215, 216, 217, 224; Manufactu
24, 34, 35, 40, 41, 42, 53 to 55, 58, 59, 62 to 68, 81, 82,
to 125, 131 to 135, 150 to 153, 263, 268, 269 to 272, 286;
115, 155, 163, 176, 187, 214, 225, 245, 246, 287, 243; Oil 69,
ck raising 127, 138, 140, 172, 173, 183, 185, 186, 188, 1
ardening and markets 7, 47, 111, 149, 387, 393, 395, 423, 4
484, 485, 555, 572. For additional subjects see class
al Guidance.

RECREATIONS

should play as well as work. The class will profit l
ie various ways of spending leisure shown in the stereo
nited States 38, 49, 50, 51, 60, 72, 83, 114, 169, 182, 191 to
205 to 209, 219, 221 to 223, 228, 229, 236; Hawaii 61;
; Mexico 290; Argentina 316; Greenland 343; Engla
lland 402; Norway 407; Sweden 418; France 422, 424
vitzerland 446, 448; Italy 455, 459; Austria-Hunga
468; Roumania 471; Asia Minor 490; India 505; Bur
4 535; Java 545; Rhodesia 577, 578

Tobacco 112; Peanut 118; Celery 49. *Which is the most valuable fruit in the United States? In the world?* Peaches 85; Apples 175; oranges 237; Pineapple 108. *Which is the most valuable fighting machine?* Airplane 426; Battleship 254; Submarine 242; Zeppelin 394. *Which is the strongest building material? Most useful? Most valuable?* Wood 216; Stone 210; Concrete 253; Granite 3; Marble 4; Iron 62; Steel 66. *Which feeds the most people in the United States? In the world?* Wheat 233; Corn 136; Rice 550; Potatoes 166. *Which is the most valuable animal to man?* Cow 159; Hog 183; Sheep 190; Horse 138; Mule 124; Dog 246; Elephant 509; Camel 564; Goat 411; Reindeer 413; Chicken 56. *Which is the most valauble for sugar?* Maple 130; Cane 258; Beet 270. *Which fiber is the most useful for clothing?* Cotton 119; Linen 269; Silk 22; Wool 17. *Which canal carries the most traffic? Cost the most? Most valuable to the United States? Most valuable to world?* Panama 253; Suez 559; "Soo" 154. *Which is the best breed of draft horses?* Percheron 138; Belgian 398. Further subjects for debate may be had as follows: *The Indians badly treated* 182; *Village a good place to live* 445, etc. For further suggestive topics see Index.

THE STORY OF IT

Some pictures at once suggest a story, anecdote, or historical account. Let the pupils vie with each other. in holding the interest of the class by their narratives in the case of the following:

Old North Church 6; Old State House 8; Shaping shoes 12; Immigrants 32; Sleepy Hollow 36; Newburgh 37; Erie Canal 48; Culp's Hill 73; Liberty Bell 80; Pocahontas 98; Harpers Ferry 101; Old slave market 109; Wounded alligator 110; Lincoln's cabin 113; The Alamo 126; Marshall Joffre 146; Hiawatha 158; Hiawatha and Minnehaha 169; Sioux Indian 182; Nova Scotia 262; Castle of Chapultepec 283; Battleship *Maine* 296; Santiago 299; Perry expedition 342; Roald Amundsen 346; Shakespeare's birthplace 354; Wallace Monument 368; Ellen's Isle 369; Bison 232; Luther Burbank 235; San Gabriel Mission 241; Gatun Lock 250; Anne Hathaway's cottage 355; Stirling castle 367; Highland home 373; Blarney castle 376; Nuremburg 387; Milking goats 411; Constantinople 473; Threshing in Greece 479; The Kremlin 483; Sacred Ganges 501; Taj Mahal 502; Faneuil Hall 7; Longfellow's home 9; Skyscrapers 25; West Point 39; Pittsburgh 61; Hauling ammunition 71; Capitol 87; Congressional Chamber 88; White House 91; Congressional Library 95; Lookout Mountain 114; Cotton 119; Cliff dwellers' palace 205; City of Mexico 282; Incan palace 331; Tower of London 349; Westminster Abbey 350; Rydal Mount 362; Burns' cottage 372; Notre Dame 425; Cathedral 429; Alhambra 436; Gibraltar 439; Rome 450; St. Peter's Cathedral 451; Coliseum 452; Mount Vesuvius 453; Neapolitan team 454; Tenement district 455; Florence 456; Grand Canal 457; Cathedral 458; Danube Canal 462; Vienna 463; Andrassy Strasse 464; Serajevo 466; Czerna-Voda 470; Galata Bridge 472; Athens 475; Excavators 477; Temple of Zeus 478; Petrograd 482; Damascus 493; Warsaw market 485; Mount of Olives

495; Nazareth 497; Howrah Bridge 500; Jumma Mosque 503; Nankow Pass 524; Rice fields 527; Manila 547; Alexandria 558; Suez Canal 559; Nile 564; Sphinx 565; Egypt 566; Colossi 567; Karnak 568; Army Transports 580. For additional subjects see Geographical classification.

PUTTING YOUR READER THERE

Making another see and feel what he would see and feel if he were present at a certain place at a certain time, is not easy, especially if you depend upon words. Nevertheless, the pupils will enjoy trying to picture a few of the scenes. Warn them to use concrete specific words.

Suggested Subjects: Unloading logs 1; Charming landscape 38; West Point 39; Palisades 51; June Carnival 72; Washington 93; Mt. Vernon 96; Blue Ridge Mountains 102; Marshall Joffre 146; Draining land 161; Sioux Indians 182; Broncho corral 188; Indian family 204; Wild elk 189; Yellowstone 191; Angel Terrace 192; Illecillewaet Glacier 275; Mt. Sir Donald 276; Tower of London 349; Oranges 238; Ostriches 239; Pigeons 240; Chilcoot Pass 243; Placer mining 245; House of Lords 352; Submarine 242; Zeppelin 394; Royal Palace 417; Taj Mahal 502; Japanese home 533; Iroquois Indians 265; Stratford on Avon 356; Loch Katrine 369; River Rhine 391; Woodcarver 443; Fuji Yama 525; Milk cart 396; The Lotefos 407; Spinning 409; Making bread 410; Picking oranges 437; Blowing Alpine horn 446; Packing goods 449; Neapolitan team 454; Shepherds 480; Bell market 484; Dairy maids 487; Ferryboats 507; Elephants hauling logs 509; Picnic party 510; Making roads 516; Wheelbarrow train 518; Chinese farmer boys 522; Chinese sawmill 523; Gathering tea 530; Drying sardines 531; Jap tea house 534; Japanese park 535; Hulling rice 550; Threshing beans 562; Sphinx 565; Shipping ivory 573; Hippopotamus hunt 577; Diamond mine 581.

"HIKING" REPORTS

Oral or written reports of scenes visited, observation made, and experiences enjoyed on "hikes" offer a splendid basis for English composition. These stereoscopic views are so vividly real that in studying them one may well feel himself a part of the scene. He can thus write on the story of the "hike" with all the reality of the actual visit. For definite selections for this purpose see topic of Hikes in classification on Outdoor Life.

BUSINESS LETTERS

The Keystone "600 Set" provides scenes which suggest business activities in practically every phase of life in all parts of the world. The thoughtful study of the stereograph by the pupil arouses interest, and stimulates his imagination to deal with the subject as though it were a real experience. The accompanying text supplies the necessary facts. The sugges-

tions herewith given call for letters which direct thought into channels of practical application and at the same time furnish the basis for an excellent drill in the use of correct English.

28 World Building. Write a letter enclosing a check or money order for a year's subscription to the New York *World*.

79 Shipping coal. Write an anthracite coal company in Ashley, Pa., and order a carload of anthracite coal (chestnut) to be sent to you in August.

52 Great ocean liners. Write to a steamship company at Hoboken, N. J., and ask for a position as wireless operator on one of their boats. State age, qualifications, experience.

47 Loading cantaloupes. A boy's father gave him a piece of land upon which he raised Rocky Ford muskmelons. He sold 50 boxes of the fruit fresh and of standard size to a commission merchant in Pittsburgh, Pa. Write the letter in which he offered the fruit for sale.

56, 1500 Hens. Write to the Corning Egg Farm, Bound Brook, New Jersey, enclosing one and one quarter dollars, for a setting of selected eggs.

Write to the Corning Egg Farm, Bound Brook, N. J., and order 100 dozen eggs at fifty cents a dozen. Enclose check.

45 1000 lbs. of butter. Offer to some wholesale dealer in Buffalo, N. Y., this 1000 lbs of butter freshly churned from sweet cream. Tell that it will be done up in waxed paper, in cardboard boxes, each box containing one pound.

55 Weaving silk ribbons. Order from Marshall Field Co. (view 139) five yards of ribbon like enclosed sample. Also enclose check or money order.

11 Shoe factory. Write to the Lynn Shoe Co., Lynn, Mass., and say that you are a skilled shoe cutter, and ask if they have any places open in their leather cutting department.

38, 39 Along Hudson River. Write to a Hudson River Steamboat Co. for rates from New York City to Albany. Ask for illustrated booklet and enclose stamps.

44 Spraying in apple orchard. Write to the Agricultural Department, Washington, D. C., and ask what is best to use for spraying apple trees in the summer time.

Send a sample of a diseased apple tree to your state agricultural department. Ask what is the matter and what you can do for it.

Write to a farmer you know saying that you have gone into the business of caring for orchards and would like to spray and trim his trees.

58 Firing tableware, Trenton. Write to a pottery company in Trenton, N. J., and tell them that you received their letter of the 10th of last month saying that the goods had been shipped. Tell them that the shipment has not reached you and ask them if they will try to trace it.

60 In the surf, Atlantic City. Write to the proprietor of a great hotel in Atlantic City to reserve for you two rooms with baths, for the second week in July. You want rooms overlooking the sea.

69, 70 Oil well. Write to an oil driller living in Oil City, Pa., and ask him what will be the earliest time when he can drill on your farm 10 miles north of Oil City.

2 Wild moose. Write a letter to a guide in Moosehead, Me., asking him about arrangements and expenses for a two weeks' hunting trip through Maine woods. You wish to hunt in November.

82 Baldwin Locomotive Works. Write a letter to yourself from the general superintendent of the Baldwin Locomotive Works, asking you to call at his office as soon as possible.

85 Gathering peaches. Write to a man in Woodside, Del. Ask him if he will have any peaches like those he sold you last year and if so, how many.

88 Joint session Congress. Write to your congressman asking for some government seeds.

90 View from State Building. Write to the State Department, Washington, D. C., giving your age, stating that you are a natural-born citizen of the United States that you wish to go to South America, and asking for a passport.

21 Manufacturing jewelry. Write to a jewelry firm in Providence, R. I., asking for designs and prices for class rings. The rings are to bear the initials of your school and the year when you graduate.

25, 30 New York. Write to a great hotel in New York City asking to have reserved for you an outside room with bath. Give time when you will arrive and leave.

115. Mining phosphate. Order a carload of phosphate from Columbia, Tenn.

118 Harvesting peanuts. Your father gave you 100 lbs. of peanuts. Write a letter to a firm in Little Rock, Ark., offering them for sale.

127, 186 Paloduro and Geneseo ranches. Write to some man on the Paloduro Ranch, Palodura, Tex., and offer him a place as superintendent of your ranch at Geneseo, Kan.

130 Tapping maple tree. Offer a commission firm in Cincinnati 150 gallons of maple syrup. Say that it was made from the first run of sap, is of standard weight and of the finest quality, put up in gallon tin cans and that your price is $1.50 per gallon. Order the syrup to be sent to you by freight. Enclose a check for the amount.

132 Goodrich rubber factory. Ask for a position as bookkeeper in the Goodrich Rubber Co., Akron, O.

138 Percheron draft horses. Write a very nice note requesting some one to pay you the remaining $125.00 which he still owes on the team of Percheron draft horses which he purchased from you on June 12 of last year.

Write the answer to the above letter.

142, 144 Packing house scenes. Order from Swift & Co., Chicago, Ill., 500 lbs. of fresh sausage and 1000 lbs. of lard.

143 Trimming hams. Order from Armour & Co., Chicago, Ill., 500 lbs. ham and eight hind quarters of prime western beef.

150 Assembling room, automobile plant. Write a note to a man you know asking him to set a time when you may call and show him an automobile you are selling.

151 Cadillac automobile plant. Send a note to the Cadillac agent in your town telling him that your new machine is not acting right and ask if he will send a man to attend to it.

166 Digging potatoes. Write to a firm in Minneapolis describing 200 bushels of potatoes and offering them for sale. They are large, smooth, of the Early Ohio variety.

172 Hogs in rape pasture. Your father promised you half the money obtained from the hogs on the farm. Write to the agricultural department of your state for information concerning the raising of hogs.

Write to your state experiment station for bulletins on same topic.

175 Picking apples. This boy has ten barrels of apples as his own. Write to a commission house in Chicago describing variety, method of growing, picking, sorting and packing.

178, 179 Tractors in operation. Write to your agent in Watertown, S. Dak., telling him that at the beginning of the next month the price of all tractors will advance 5%.

180 Case tractor. Write to Case Tractor Co., Chicago, Ill., for catalogues.

181 Case tractor. Write to Case Tractor Co., Chicago, Ill., saying wheel on tractor broke and you are sending it to be repaired or replaced.

184 Corn field, Kansas. Write to a real estate firm in Atchison, Kansas, asking if they know of a good farm for sale. You wish a good grain farm.

184, 136 Corn fields. Write to the director of your corn club saying that you planted one acre of corn, doing the plowing, harrowing, planting, cultivating and harvesting yourself without help. Also state that your yield is 125 bushels of shelled corn.

190 Sheep on range. Offer Cudahy & Co., Omaha, 10,000 sheep delivered at railroad in Grangersville, Ida., Sept. 1.

191 Yellowstone National Park. Write to Superintendent of Yellowstone Park for trip books.

198 Cultivating sugar beets. Write to a beet sugar company in Greeley, Col., asking prices per ton for raw sugar.

199 Colorado wheat field. Write to your agent in Fort Collins, Col., asking him to buy and ship to you in Chicago, all the wheat that he can get up to 100,000 bu.

220 Bird's-eye view of Seattle. Write to Traffic Manager of the Northern Pacific R. R., Chicago, Ill., asking for information concerning a trip to Alaska.

234 Harvesting almonds. Write to a commission merchant in San Francisco offering 20 sacks of large, thin-shelled almonds for sale.

236 238 Orange trees. Order from a firm in Los Angeles 100 boxes of navel oranges and 50 barrels of Tokay grapes.

239 Cawston ostrich farm. Order four natural ostrich feathers at three dollars each from the Cawston Ostrich Farm, Cal. Enclose check or money order.

240 Los Angeles pigeon farm. Send out several letters to people in Los Angeles, Cal., saying that you are able to furnish squabs, and say that you will deliver them on Wednesdays and Saturdays. Describe squabs and state your price.

264, 265 Quebec; 267 Montreal. Write to Canada steamship lines, enclosing 2c postage for map and guide for trip down St. Lawrence River from Niagara to Quebec.

289 Sisal hemp field. Write to your agent in Merida, Yucatan, telling him to buy and ship to you 1000 lbs. of sisal hemp fiber.

310, 311 Sao Paulo coffee scenes. Write to the American Consul in Sao Paulo asking information as to coffee crop, prices, etc.

314 to 321 Argentine views. Write to the President of the Pan-American Union, Washington, D. C., asking for pamphlets giving information concerning Argentine.

546 to 551 Philippine views. Write to the Commissioner of Education, Washington, D. C., asking for a position as teacher in the Philippines. Give your qualifications and experience.

19. SPELLING

By WILLIAM ESTABROOK CHANCELLOR, A.M.

AUTHOR OF EVENING SCHOOL SERIES, GRADED CITY SPELLERS; HOW TO TEACH SPELLING, ETC., WOOSTER, OHIO

Teachers will find it particularly advantageous to use each day for the spelling lesson the stereographs that have lately been used in Geography, History, English, Nature Study, etc., and thus correlate the various studies and at the same time profit by the interest aroused by the views.

Until a few years ago, there were no spelling books upon the market in which the objects were illustrated with all the name words presented. Even now, there are no books that completely fill this requirement. Yet in the Keystone "600 Set," it is possible to find at least one instance in which almost every important noun in our language is called for. Very many of the familiar action words are also illustrated in these views. To a considerable extent, this is true for adjectives and for adverbs also. A notable case of associating the word with the object named is that of the very large number of cities of which views are given. To present spelling in this fashion is to convert the mechanical into the living.

The pupils themselves may build up spelling books for agriculture, for geography, for history, for manufacture, for commerce, and for many other lines through the use of these views with the accompanying descriptions. Making to an extent their own textbooks carefully a page or two every week is a new device of no small value in training youth in initiative, ingenuity and accuracy.

Especial attention may be called to the pronunciation and diacritical marking of many difficult words upon the backs of these views. It is, however, advised that in giving the spelling exercises along the lines previously suggested, syllabication and diacritical marking, important in regular spelling

lessons, be subordinated to spelling narrowly defined, which means getting the letters in their right order in words.

It may be suggested that letter-writing by one pupil to another in the same class about these views affords an opportunity for practising spelling. Such letter-writing is sometimes extended between the schools of a city or of a county and even to schools at great distances.

An exercise of this character might be conducted competitively by a teacher who asked the pupils to pick out their favorite view according to the taste of each, and to write to him a letter telling what the pupil sees in his chosen picture.

Before the class that has access to these 600 views, the world in its glory and wonder, in its variety and fascination lies open. It is a marvelous panorama. To describe it adequately would involve more than ten thousand words, which happen to be several times as many as any boy or girl really needs. From view 10 with its inspiration to patriotism to view 599, with its revelation of the infinite universe of the stars, from the delightful humor of view 522 to the tense, grim toil indoors of view 156, from wild life to city crowds, from Indians and Patagonians to palaces and thrones, this "600 Set" runs the gamut of human interest; and there is scarcely a word of importance in American speech or literature not to be used naturally and logically in discussing at least one scene here. No one is ever the master of a word until he knows both how to use it and how to spell it.

Any teacher may take these views and write for each of them one by one in the course of a year of teaching from one to twenty words, and in the end have a spelling book of at least 600 words and for the highest grades perhaps several thousand, for every one of which the pupils will have, through class use in spelling, a definite correlate in reality. Indeed the pupils themselves will make the book, and in the end it will be a spelling-book of the highest value to all who have made it.

Moreover, the preparation of such a class book with an individual book perhaps not so large, for each pupil will tend to keep the views themselves in memory and to make their meaning plain and permanent.

EXERCISE I

For Third Grade

Take view 46, Machine for filling milk bottles and capping them. Ask the pupils what they see in it. They may name objects, and they may tell of actions in sentences. In part, this will depend upon the way of teaching English and other subjects, and in part it will depend upon their grade and age. A *Third Grade Class* might report somewhat as follows, viz.:

The men have rubber boots on.
I see milk in bottles.
They are wearing white overalls.
The floor is wet.
I count four men.

Also *dairy, pipes, boxes, handles, caps, clean.*

These words may then be taught orally, viz.— *bot'tle, box'es, floor, clean,* etc.

Suggested Subjects: 44 Apples; 294 Bananas; 209 Cactus; 303 Cocoa; 302 Coffee; 72 Daisies; 236 Grapes; 237, 238 Oranges; 85 Peaches; 118 Peanuts; 108 Pineapples; 137 Pumpkins; 83 School garden; 571, 289 Sisal hemp; 530 Tea; 110 Alligator; 196 Beaver dam; 232 Buffalo; 57, 127 Cattle; 565, 564 Camel; 56 Chickens; 13 Codfish; 279 Eskimo dogs; 509 Elephant; 189 Elk; 583 Gannets; 216 Geese; 411 Goats; 183 Hogs; 398 Horses; 588 Kangaroos; 335 Llama; 2 Moose; 239 Ostrich; 86 Oysters; 584 Penguins; 413 Reindeer; 226 Salmon; 345 Seal; 173 Sheep; 111 Sponge; 415 Whales. For other suitable subjects see group For the Little Folks.

EXERCISE II

For Fourth Grade

Take view 359, A nightingale in its sheltered nest. Talk about this richly suggestive scene of the parent bird in the deep thicket of leaves, grass and twigs. The nightingale has the most beautiful song of all birds. Read part or all of the description upon the back of the card. Then ask the pupils to write down all the words that the scene suggests and have them read their lists. Girls generally delight in pictures of this kind. A *Fourth Grade Class* might write down all these words, and more, viz.: *bird, nightingale, leaves, thicket, eyes, grass, twigs, protect, damp, cool, bright, shelter, safe, sing, many, love, dark, light, small, parent, deep, mother, father, male, female, different, fly, hear, eggs, babies, stems, plain, clear, see, find.* From whatever words the pupils give, a few may be chosen for drill at the end of the exercise, for example: *Leaves, shel'ter, dif'ferent, clear.*

Suggested Subjects: 1 Log pile; 113 Log cabin; 96 Mt. Vernon; 9 Longfellow's home; 205 Cliff dwellers; 281 Adobe hut; 214 Miner's home; 299 Cuban home; 30 New York; 224 Great tree; 162 Hauling logs; 215 Log raft; 216 Sawmill; 3 Granite; 5 Marble; 178 Plowing;

179 Tractor; 166 Potatoes; 149 Celery; 270 Sugar beets; 218 Threshing; 199 Wheat; 56 Poultry; 57 Dairy; 165 Dairy farm; 159 Dairy cattle; 183 Hogs; 185, 140 Cattle; 258 Sugar cane; 302 Coffee; 303 Cocoa; 105 Rice; 294 Bananas; 236 Grapes; 237, 238 Oranges; 175 Apples; 108 Pineapples; 190 Sheep; 226, 227 Salmon; 111 Sponges; 97, 86 Oysters; 292 Corn cakes; 141 to 144 Packing house; 117, 124, 119 Cotton; 17, 18, 81 Wool; 145 Shearing sheep; 268, 269 Linen; 55, 22 Silk; 11, 12 Shoe factory; 246, 279 Dog teams; 169 Indian canoe; 42 Four track R. R.; 87 Capitol; 88 Congress; 89 Supreme Court; 91 White House; 92 Cabinet room; 95 Library; 94 Paper money; 266 Soldiers; 39 Hudson River. For other suitable subjects see group For the Little Folks.

EXERCISE III

For Fifth Grade

Take view 83, School gardens as a practical educational method. School gardens are helpful in educating boys and girls in raising vegetables and fruits. Here we have a scene in Philadelphia that shows Boy Scouts and Camp Fire Girls doing garden work. A *Fifth Grade class* might prepare a long list of words to be placed upon the blackboard. Go around the class asking each pupil in turn to name one word for spelling. The list may include these words, viz.: *chil'dren, plants, hoe'ing, slip'pers, bare'foot, hats, cloaks, poles, to ma'toes, rows, boys, girls, kha'ki, beans, peas, white, tan, braids, hair, work, lit'tle, sign, troop, trees, play, cat, paths, wat'ering can, stand'ing, veg'e-ta bles, money, save, earn, help, use'ful.*

Erase the list. Repeat the words one by one, and test the pupils in oral spelling. Make a note for future use of each word misspelled.

Suggested Subjects: 7 Boston; 25 New York; 33 Dining room; 38, 39 Hudson River; 49, 50 Niagara Falls; 56 Poultry; 57 Dairying; 58, 59 Pottery; 60 Atlantic City; 61 Pittsburgh; 69, 70 Oil; 72 Daisy pole; 73 Gettysburg; 74 to 79 Coal; 80 Liberty bell; 84 Government mint; 85 Peaches; 86 Oysters; 87 Capitol; 88 Congress; 91 White House; 96 Mt. Vernon; 101 Harpers Ferry; 104, 105 Rice; 107 Turpentine; 108 Pineapples; 110 Alligator; 111 Sponges; 112 Tobacco; 113 Log cabin; 117 Cotton; 121 Oklahoma City; 131 to 133 Rubber; 134, 135 Glass; 138 Horses; 139 Chicago; 140 Stock market; 141 to 144 Packing house; 147 Oats; 149 Celery; 150, 152 Automobiles; 153 Salt; 172 Hogs; 173 Sheep; 182 Indians; 187 Butte; 189 Elk; 191 to 197 Yellowstone Park; 210 Roosevelt dam; 226, 227 Salmon; 234 Almonds; 236 Grapes; 239 Ostriches; 240 Pigeons; 242 Submarines; 246 Dog team; 253 Panama Canal. For other suitable subjects see Index.

EXERCISE IV

For Sixth Grade

Take view 80, The Liberty Bell, Independence Hall, Philadelphia. Tell as much of its story as suits the grade and conditions. Ask the

pupils to write down whatever words it suggests to them. Call for the words, and write upon the blackboard: 1. Those reported by several pupils; 2. Those misspelled; and 3. Important words within the comprehension of most in the class. From the entire list, select several to be carefully studied. These may be taught both orally and in writing. A *Sixth Grade Class* might report these words, viz.:

1. *Liberty, frame, bell, staircase, crack, motto, rang.*
2. *Independence, Philadelphia, support, proclaim, inscription.*
3. *Freedom, nation, country, exposition, inhabitants.*

The teacher might select these words as being required by the class and suitable to learn at the time when the lesson is to be given, viz.: *liberty, motto, proclaim, country.*

This is enough material for a fifteen or twenty minute lesson; longer lessons are not usually profitable.

Suggested Subjects: 184, 136, 137, 160, 292 Corn; 357, 199, 177, 233, 218, 284, 479, 497, 498 Wheat; 147, 408 Oats; 105, 104, 549, 550, 528 527, 530, 529 Rice; 47, 166 Potatoes; 562 Beans; 137 Pumpkins; 419, 198, 270 Sugar beets; 332, 333, 258, 35, 34 Sugar cane; 130 Sugar maple; 294 Bananas; 237, 238, 437 Oranges; 108 Pineapples; 236, 319, 390 Grapes; 293 Mangoes; 259 Papaws; 85 Peaches; 44, 175 Apples; 234 Almonds; 551 Coconuts; 118 Peanuts; 303 Cocoa; 302, 310, 311, 295 Coffee; 530, 521, Tea; 285 Pulque; 57, 339, 487, 46 Milk; 45 Butter; 159, 403, 591, 371 Dairy cattle; 411 Goats; 413 Reindeer; 25 to 31 New York; 80 to 84 Philadelphia; 139 Chicago; 314 to 316 Buenos Aires; 348 to 352 London; 383 to 385 Berlin; 421 to 425 Paris; 454 Naples; 458 Milan; 464 Budapest; 485 Warsaw; 499 Madras; 514 Hong Kong; 517 Hankow; 520 Pekin; 569 Cairo; 585 Sydney; 586 Melbourne; 9 Cambridge; 21 Providence; 42 Syracuse; 48 Buffalo; 78 Scranton; 87 to 91 Washington; 116 Birmingham; 119 New Orleans; 167 Minneapolis; 220 Seattle; 230 San Francisco; 463 Vienna; 482 Petrograd; 500 Calcutta; 526 Tokyo. For other suitable subjects see Index.

EXERCISE V

For Sixth Grade

Take view 501, Pilgrims bathing in the Ganges River, before the Temple at Benares. This view also lends itself aptly to oral or written dictation as indicated in the Exercise above. It is also well adapted for study according to the method in Exercises I, III and IV. The dictation might be something like this, viz.:

To the Hindoos, the Ganges is a sacred river. Every year, hundreds of thousands of pilgrims come to its waters to bathe that their sins may be forgiven and their diseases cured. At Benares, there is a great temple with many steps leading down to the river. Near the banks, the water is shallow, and the pilgrims go out upon floats from which they jump into the stream for purification. The richer men and women keep parasols over their heads to protect them from the blazing hot sun. The temples, domes, steps, windows and multitudes

make an impressive sight to European observers. This passage is suitable for *Sixth Grade.*

Suggested Subjects: 370, 317, 358, 589, 127, 186, 301, 185, 140 Beef Cattle; 183, 172, 122 Hogs; 190, 173, 480, 145 Sheep; 577, 578 Hippopotamus; 531 Sardines; 481 Fish market; 345 Seal; 415 Whales; 117, 124, 125, 119, 286, 14, 15, 16 Cotton; 268, 269, 40 Linen; 552, 553 Manila hemp; 536 to 541 Silk; 74 to 79 Coal; 68 Coke; 378 Peat; 122, 69, 70, Oil; 115 Phosphate; 116, 65 to 67 Steel; 163, 164, 128, 62 to 64 Iron; 187, 155 to 157 Copper; 243, 246, 245, 225, 579 Gold; 581 Diamonds; 512 Gems; 505, 509 Elephants; 103, 543 Charcoal; 107 Turpentine; 412 Paper; 532 Japanese shoes; 402, 403 Wooden shoes; 345 Skis; 263 Wigwam; 92 to 95 Washington; 37 Newburgh; 52 Hoboken; 60 Atlantic City; 106 Savannah; 109 St. Augustine; 126 San Antonio; 128, 129 Conneaut; 148 St. Louis; 149 Kalamazoo; 156 Calumet; 176 Joplin; 212 Salt Lake City; 213 Ogden; 242 San Diego; 267 Montreal; 281 to 283 Mexico; 308, 309 Sao Paulo; 312, 313 Montevideo; 324 Santiago; 326, 327 Valparaiso; 365 Edinburgh; 380 Dublin; 381 Belfast; 387 Nuremburg; 389 Strassburg; 396 Antwerp; 416 Stockholm; 6 to 8 Boston; 61 Pittsburgh; 152 Detroit; 174 St. Louis; 347 Liverpool; 386 Hamburg; 393 Cologne; 395 Brussels; 433 Barcelona; 435 Madrid. For other suitable subjects see Index.

EXERCISE VI

For Seventh and Eighth Grade

Take view 296, Wrecked battleship *Maine,* showing mine explosion results.

There are two useful forms of dictation, one oral when the teacher dictates sentences and requires the pupils to write them down a few words at a time, the other written when the teacher places the dictation upon the blackboard, has the material studied, and then after erasing, reads the material slowly to the pupils, as they write. For *Seventh Grade,* the latter is a good method for occasional use, while the former may be tried for not too long a passage in the *Eighth Grade* or *Junior High School.*

The sentences used should not be too complicated nor too long. The following form is suggested for the grades indicated:

Upon February 15, 1898, the battleship *Maine* was blown up in the harbor of Havana, Cuba. Great indignation was immediately felt throughout the United States against Spain, which owned the island. In the war that followed, our country was successful. But nothing was done until March, 1912, when the wreck was towed out of the harbor and given an honorable sea burial in deep water.

Note: We may indicate the name *Maine* as the name of a ship either by printing it in Italic or by quoting it, using punctuation marks, like this, "Maine." In writing, we may either underscore the word or quote it, as in print.

Suggested Subjects: 6 Old North Church; 8 Old State House; 9 Longfellow's home; 10 Lexington Common; 14 to 16 Cotton mill; 22 to

24 Silk; 25 to 32 New York; 37 Newburgh; 39 West Point; 44 Spraying apples; 45, 46, 57 Dairying; 48 Erie Canal; 52 Ocean liners; 56 Poultry; 60 Atlantic City; 61 Pittsburgh; 62 to 64 Iron; 65 to 67 Steel; 68 Coke; 69, 70 Oil; 73 Culps Hill; 74 to 79 Coal; 80 Independence Hall; 84 Mint; 87 to 95 Capitol; 96 Mt. Vernon; 100 Hampton Roads; 109 St. Augustine; 113 Lincoln's cabin; 117, 119 Cotton; 120 Mississippi Delta; 127, 186, 185, 140 Cattle; 139 Chicago; 141 to 144 Packing houses; 146 Marshall Joffre; 154 "Soo" Canal; 170 Keokuk Dam; 176 Zinc; 187 Copper; 190, 173 Sheep; 191 to 197 Yellowstone Park; 205 Cliff dwellers; 231 Earthquake; 242 Submarines; 243 Alaska; 249 to 256 Panama Canal; 273 Winnipeg; 274 to 276 Glaciers; 290 Mexicans; 296 Battleship *Maine;* 325 Nitrate; 328 Indians; 331 Incan palace; 338 La Guaira; 342, 343 Arctic; 344, 346 Antarctic; 348 to 352 London; 367, 368 Stirling; 383 to 385 Berlin; 394 Zeppelin; 404 to 406 Copenhagen; 416 to 418 Stockholm; 421 to 425 Paris; 426 Airplane; 432 Monaco; 436 The Alhambra; 439 Gibraltar; 448 Matterhorn; 450 to 452 Rome; 462, 463 Vienna; 466 Bosnia; 475, 476 Athens; 482 Petrograd; 495 Jerusalem; 502 Taj Mahal; 508 Himalayas; 524 Great Wall, China; 525 Fuji-Yama; 546 to 553 Philippines; 558 to 569 Egypt; 579 to 584 South Africa; 585 to 589 Australia; 593 to 600 Earth Neighbors. For other suitable subjects see Index.

EXERCISE VII

The purpose of this exercise is to arouse in the pupils a desire to accumulate a vocabulary. Give each one in the class a different stereograph. Then let the pupils have five minutes to see which ones are able to write and spell the largest number of words suggested by the picture that each one has.

Suggested Subjects for Second and Third Grades: 72 Daisies; 105 Rice; 110 Alligator; 117 Cotton; 140 Stockyards; 190 Sheep; 204, 263 Indians; 226 Salmon; 229 Trees; 232 Buffalo; 239 Ostriches; 279 Dogs; 336 Ecuador; 341 Baker; 396 Milk cart; 398 Horses; 402 Dutch street; 410 Flat bread; 431 Washing clothes; 443 Wood carving; 446 Alpine Horn; 507 Ferry boats; 509 Elephants; 522 Plowing; 530 Tea; 531 Sardines; 533 Japanese home; 542 Peddler. For other suitable subjects see Index.

(For the second and third grades, a variation of this plan would be to make teams of three pupils each and see which will win. Put into each team at least one pupil who is especially proficient in vocabulary and in spelling.)

Suggested Subjects for Fourth and Fifth Grades: 6 Boston; 10 Lexington; 42 Salt; 50 Niagara Falls; 60 Atlantic City; 71 Prairie schooner; 76 Coal; 98, 169, 182 Indians; 108 Pineapples; 127, 186, 548 Cattle; 130 Maple sugar; 188 Horse ranch; 191 Golden Gate; 194 Geyser; 206 Petrified forest; 209 Desert vegetation; 215 Lumber; 218 Wheat; 231 Earthquake; 236 Grapes; 243 Chilcoot Pass; 246 Alaska; 290 Mexicanas; 294 Bananas; 335 Llama; 340 Caracas; 367 Stirling Castle; 373 Highland Home; 394 Zeppelin; 413 Reindeer; 426 Airplane; 439 Gibraltar; 445 Chalet; 491 Buffalo; 505 Elephant; 514 Hong

Kong; 537 Mulberry leaves; 550 Rice; 577 Hippopotamus; 588 Kangaroo. For other suitable subjects see Index.

Suggested Subjects for Sixth and Seventh Grades: 27 Brooklyn Bridge; 44, 175 Apples; 94 Money; 107 Turpentine; 111 Sponges; 113 Lincoln's birthplace; 117, 119 Cotton; 142 Packing house; 149 Celery; 168 Indians; 177 Threshing; 184 Corn; 197 Yellowstone Park; 202 Box Canyon; 205 Cliff Dweller's Palace; 210 Irrigation; 221 Mt. Hood; 222 Crater Lake; 249 Isthmus of Panama; 276 Mt. Sir Donald; 288 "Old Popocatepetl"; 291, 300 Volcanoes; 325 Nitrate; 349 Tower of London; 363 Wales; 366 Highlanders; 385 Soldiers; 399 Zaandam; 421 Paris; 432 Monaco; 441 Mt. Pilatus; 472 Constantinople; 483 The Kremlin; 496 Jerico Road; 498 Grinding wheat; 528 Rice; 535 Japanese maids; 524 Wall of China; 425 Paris; 540, 541 Silk; 546 Houseboats; 549 Harrowing Rice; 576 Victoria Falls; 582 Capetown. For other suitable subjects see Index.

Suggested Subjects for Eighth Grade or Junior High School: 5 Marble; 12 Shoes; 26 New York City; 49 Niagara Falls; 55 Ribbons; 95 Library; 120 Mississippi Delta; 126 Alamo Plaza; 131, 132, 133 Rubber; 135 Glass; 156 Copper; 180 Tractor plowing; 195 Yellowstone National Park; 207 Grand Canyon; 219 Mt. Ranier; 242 Submarines; 252 Panama Canal; 275 Glacier; 281 Adobe hut; 330 Cofa Bridge; 348 London Bridge; 353 Greenwich; 354 Shakespeare's birthplace; 365 Edinburgh; 407 Lotofos; 414 Midnight sun; 417 Stockholm; 444 Lauterbrunnen Valley; 450 Rome; 452 Coliseum; 457 Grand Canal; 458 Milan; 475 Athens; 477 Corinth; 504 Jaipur; 502 Taj Mahal; 506 Srinagar; 508 Himalayas; 511 Colombo Harbor; 516 Road making; 554 Guam; 568 Karnak; 599 Meteor. For other suitable subjects see Index.

These have been chosen because they appear to offer in each case a large number of opportunities to present nouns and adjectives learned from the studies in preceding grades.

EXERCISE VIII

There are many cards that may be used in pairs, in trios and even in larger combinations for spelling lessons. The scenes and individual objects in these grouped cards suggest by their likenesses and differences many words for spelling. One exercise might be this, viz.:

Make teams of a considerable number of boys or girls each; assign to them places at the blackboard, and hand to each team a pair or trio of cards with the same general subject for the cards in each group; and see which set of pupils can write the longest list of words in a given period of time, say five minutes; with only words correctly spelled to be counted.

This exercise can be extended by having the pupils upon the previous day make their own pairs or trios of cards to be upon the same general subject, as for example:

49, 50 Niagara Falls.

49, 50, 197, 225, 228, 318, 407, 444, 576 Water falls.

See the Index for other combinations.

Of course, to be fair, each group should be allowed the same number of cards; and it may be wise to draw lots to see which set of cards comes to each group of pupils.

Other views likely to arouse much interest in spelling are these, viz.: 67 Steel; 84 Mint; 87 Capitol; 122, 123 Oil; 144 Meat; 150 Automobiles; 161 Ditching; 162, 216 Lumber; 163 Iron; 170 Keokuk Dam; 175 Apples; 176, 225 Mining; 178 Plowing; 179 Harrowing; 189 Elk; 228 Yosemite Valley; 230 San Francisco; 244 Fish; 257 Porto Rico; 261 Hula Girls; 306 Children; 324 Santiago; 328 Indians; 339 Milk; 342 Greenland; 343 Eskimos; 372 Burns' Cottage; 376 Blarney Castle; 390 Grapes; 397 Namur; 412 Paper; 419 Sugar beets; 424 Paris; 425 Notre Dame; 453 Vesuvius; 456 Florence; 479 Threshing; 484 Bells; 487 Milk; 492 Beirut; 495 Jerusalem; 497 Palestine; 543 Charcoal; 585 Soldiers; 586 Melbourne; 594 Moon. For other suitable subjects see Index.

In general, every view in the "600 Set" may be profitably and interestingly used as the basis of a spelling exercise of some kind. In the case of many of these views, tests show that several ten-year pupils were able to prepare a list of over one hundred words for each of a dozen views within a period of five minutes.

There are very many ways to teach spelling beside those in the spelling books. The process may be turned about in using these views by asking pupils to find stated objects in the scenes — for example, 306 shows the object *balustrade* — then spell or write the word.

20. BIOGRAPHY

By CHARLES H. McCARTHY, Ph.D.

DEAN OF THE SCHOOL OF PHILOSOPHY, AND KNIGHTS OF COLUMBUS, PROFESSOR OF AMERICAN HISTORY, CATHOLIC UNIVERSITY OF AMERICA, WASHINGTON, D. C.

By biography is here meant the lives of noteworthy persons. This department of literature, which is quite distinct from history, is both ample in scope and important in content. For youthful readers its benefits are obvious. These may be noticed under two heads, namely, form and subject matter. If in the scheme of education the paramount objects are the cultivation of expression and the formation of character, the study of biography will greatly contribute to those ends, for in reading the lives of great men one sees a record of actions that are to be avoided and a report of exploits that are worthy of imitation.

The foregoing observations are well illustrated by the Keystone Views. A picture of Sunnyside or a scene on the Hudson at once suggests Irving, an author who has given Americans two splendid biographies, namely his "Life of Columbus" and his "Life of Washington." If one is interested in literary art, the form of these biographies, while not faultless, is admirable. He who is learning to write will find Irving an excellent model for imitation.

In the Burns' house at Ayr there is no suggestion of luxury or scarcely of comfort. In the view one gets the impression of sordid surroundings. Neither at Ayr nor Massgiel is there much to attract the muses, yet Robert Burns was one of the greatest of lyric poets. What if his landscape often looked dark and dreary, there was always the sunshine of the heart. Men of genius are not only superior to discouragement but even in seasons of tempest they create an atmosphere of never fading summer.

In a life of Burns the student will learn that in his labors in sterile fields the poet followed the plough tail or swung the scythe thinking of good verses or of spirited prose which only a

short time before he had read. The youth or maiden who carries in his pockets a volume of good poems, as Burns generally did, will improve in taste, in expression, and in ethics.

But while poetry and history stimulate the imagination and refine the feelings, a study of the lives of great men will serve to make clear the causes of material as well as spiritual progress. American boys and girls should become familiar with the lives of the great men connected with the discovery and colonization of the New World, with the development and independence of the English colonies which became the United States, and with the remarkable growth of that favored Republic.

No American should be unfamiliar with the main facts in the life of Columbus, Calvert, Washington, Lincoln, Penn, Franklin, Hamilton and Jefferson, Marshall and Webster and our other noted men.

It is in the study of biography that we find out what it was that distinguished Columbus from Cabot, in what respect Washington was different from the other patriots of seventy-six, and why Lincoln overshadowed the truly great men of the era of the Civil War. Differences there were between the greatest and the great, and these appear in the record of their lives.

THE NEW WORLD

Abbott, Lyman, preacher and editor, 1835—. Born in Boston (6 to 8). Home and seat of greatest activity, New York City (25 to 31).

Adams, John, second President of the United States, 1735–1826. Active in the events which led up to the Revolution; attended meetings in Faneuil Hall, Boston (7); acted as lawyer to defend the British soldiers implicated in the Boston massacre which took place in the street before Old State House (8); seconded the Declaration of Independence and signed it when passed (80 Old Liberty Bell, Independence Hall); represented the United States in Holland (399 to 403) in 1782 and was Minister to England (348). He was Minister to France. In Paris (421) 1783, signed the treaty which ended the American Revolution; took the oath of office as Vice-President of the United States in 1789, while standing on the balcony of the old federal building which stood where the United States Sub-Treasury in New York now is (29); was the first President to occupy the White House (91).

Adams, John Quincy, sixth President of the United States, 1767–1848. He was appointed Minister to Holland (399 to 403) in 1794; in 1797 became Minister to Berlin (383 to 385); in 1803 became a United States Senator (87); under President Madison was Minister to Russia (482); in 1815 was made Ambassador to England (348 to 352); in 1817 became Secretary of State (92) under Monroe and formulated the Monroe Doctrine; in 1825 was elected President of the United States (91); from 1830 to the end of his life was a member of the lower house of Congress (87, 88). Here he preserved the right of petition, the greatest work of his great life.

Adams, Samuel, American statesman, 1722–1803. He was a secretary of the Massachusetts Colonial legislature which met in the Old State House (8) and opposed the Townshend Acts. While here he drew up the famous circular letter. He presided over the town meeting which met in Faneuil Hall (7) after the Boston massacre (8) and carried its ultimatum to Governor Hutchinson. When Gen. Gage sent British troops to Lexington (10) on the 18th of April, 1775, it was to arrest the "traitors," John Hancock and Samuel Adams, who had taken refuge there, as well as to seize the powder. He was a signer of the Declaration of Independence (80 Liberty Bell, Independence Hall); was a member of Congress which met in the old federal building in Wall Street (29); from 1794 to 1797 was Governor of Massachusetts (8).

Armour, Philip D., American manufacturer and capitalist, 1832–1901. In 1863 he became a partner in a pork-packing business (143). This picture, taken in the Union Stock Yards, suggests but a small part of their business (140).

Arnold, Benedict, American Revolutionary general and traitor, 1741–1801; was wounded in a brave attack on Quebec and forced to withdraw (264); was given command of Philadelphia (80) where he earned the reprimand which so greatly embittered him; plotted to surrender West Point (39) to the British; spent his last days in London (348, 349, 352).

Balboa, Vasco Nunez de, Spanish explorer, 1475–1517. From a mountain top in the Isthmus of Panama, Sept. 25, 1513, Balboa obtained the first sight of the Pacific Ocean (256).

Bancroft, George, American historian, 1800–1891; was made collector of the Port of Boston by President Van Buren (6, 7, 8); while Secretary of the Navy (92) under President Polk, the Naval Academy at Annapolis was established; ordered the American fleet to seize California (228 to 242) if hostilities with Mexico should break out; as acting Secretary of War, ordered United States troops into Texas (122 to 127); in 1846 to 1849 was Minister to Great Britain (347 to 362). He lived several years in New York (25 to 31). In 1867 he was Minister

to Prussia; in 1868 to the North German Confederation; and in 1871 to the New German Empire (383 to 385).

Blaine, James G., American statesman and author, 1830–1893; born in Pennsylvania; member of Congress, first in the House where, for six years he was Speaker, later a Senator (87, 88); Secretary of State under President Garfield and also under President Benjamin Harrison (92); in 1884, ran for President but was defeated (91). Blaine's "Twenty Years in Congress" was a valuable contribution to our historical writings.

Bolivar, Simon, South American statesman and lover of freedom, 1783–1830. Caracas was the native city of Bolivar (340); in 1815 he was forced to retire to Jamaica (301); in 1819 was President of what is now Colombia (337) and Venezuela (340, 341), having driven out the Spanish; freed Ecuador in 1822 (336); in 1822, drove the Spanish from Peru (329, 330, 331). A part of the country under the name Bolivia (335) in honor of Bolivar, separated from Peru.

Borden, Right Honorable Robert Laird, Canadian statesman, 1854—. Premier of Canada (262 to 277).

Brooks, Phillips, Episcopal Bishop of Massachusetts, 1835–1893; was born and died in Boston (6, 7, 8).

Bryan, William Jennings, American statesman and orator, 1860—. The farm home of Mr. Bryan (181) is near Lincoln, Neb. He was a member of Congress (88) from 1891 to 1895; ran for the presidency three times (91) and was defeated; member of Wilson's cabinet (92) up to the time of the trouble with Germany.

Butler, Benjamin Franklin, American soldier, 1818–1893; in command of New Orleans (119) after it was captured by Union forces in 1862; in 1864 was in command of New York City (25 to 30); later was a member of Congress (87, 88); died in Washington (90).

Calhoun, John C., American statesman, 1782–1850; served first as a United States Representative and later as a United States Senator, won great honor and fame in Congress (87, 88); was Secretary of War and later Secretary of State (92); as Vice-President he presided over the Senate; resigned the vice-presidency to become an active Senator (87); worked earnestly for the annexation of Texas (122 to 127).

Carnegie, Andrew, American capitalist and founder of libraries, 1837—. Is a native of Scotland. Early in his career, he was interested in oil (69, 70); amassed a great fortune in the steel industry in Pittsburgh (62 to 67); is very philanthropic.

Champlain, Samuel de, French explorer in America, 1567–1635; between 1591 and 1601 visited the City of Mexico and Spanish America and suggested to the French king a canal across Panama (282, 291, 294, 248, 256); in 1603 explored the St. Lawrence River to the Lachine rapids (263 to 267); on July 3,

1608, began to lay the foundation of Quebec (264 to 266); spent part of each year in Paris and there married (421 to 425); in 1611 established a trading post on the site of Montreal (266); made many exploring excursions, discovered Lake Champlain, saw Lake Huron and the Niagara Falls (49, 50); on Christmas day, 1635, died in Quebec (264).

Clay, Henry, American statesman and orator, 1777–1852; Representative from Kentucky; four terms Speaker of the House (88); Senator from Kentucky; won the name, "the great compromiser" (87); defeated for the presidency three times (91); Secretary of State under John Quincy Adams (92).

Cleveland, Grover, American statesman and President, 1837–1908; in 1860 was mayor of Buffalo (48) and in 1870 sheriff of the county; in 1882, was Governor of New York State (25 to 50); next a lawyer in New York City (25 to 31); President of the United States (91) in 1884 and again in 1892; sent United States troops to settle a railroad strike in Chicago (139); withdrew from the Senate the Hawaiian annexation treaty and that country remained independent (259 to 261); asserted the Monroe Doctrine in the Venezuela boundary dispute (338 to 341).

Columbus, Christopher, Italian navigator, discoverer of America, 1451?–1506. He followed the court of Ferdinand and Isabella to Granada (436) and was present when that city surrendered to the Christians; in his first voyage he discovered Cuba (295 to 299) where he landed on Oct. 26, 1492; returned to Spain to the court which was then at Barcelona. There is today a great monument to Columbus in Barcelona (433). On his third voyage, he discovered South America and skirted along the coasts of Venezuela (338); in his fourth journey, sailed along the coast of Central America (293, 294); touched at Jamaica (301) where his vessels had to be beached. Columbus died in Spain and his body was buried in Santo Domingo. In 1796, his remains were transferred to Havana (295, 297).

Cooper, Peter, American philanthropist, 1791–1883; worked and won wealth and fame in New York City (25 to 31); built the first American locomotive, a very rude little contrivance, very unlike the one in this picture (43).

Cortez, Hernando, Spanish conqueror of Mexico, 1485–1547; came into this harbor and called the place Vera Cruz (280); conquered the entire country of Mexico (283); ancient Aztecs worshiped their gods on pyramids (284, 288).

De Soto, Hernando, Spanish adventurer and explorer, 1500–1542; in 1514 explored the Isthmus of Panama (247, 248, 256); in 1528 explored the coasts of Guatemala and Yucatan (291, 289); was in Pizarro's expedition in Peru (331); governor of Florida and Cuba (108 to 111, 295 to 299); on May 12, 1539, sailed from Havana harbor (295); was buried in the Mississippi River and his men succeeded in reaching its mouth (120).

Dewey, George, American Admiral and the hero of Manila Bay, (1837–1917). A United States warship, such as made up the fleet commanded by Admiral Dewey (254). At the outbreak of the Spanish-American War, Admiral Dewey sailed from Hongkong (513, 514) to Manila (546, 547); his attack on Manila was the first in the chain of events which resulted in the acquisition of the Philippines by the United States; lived in Washington (90) serving on various boards connected with naval affairs.

Diaz, Porfirio, Mexican general and former President of Mexico, 1830–1915. Chapultepec Castle, the President's residence for twenty-four years (283). The capital of Mexico which surrendered to Diaz in 1867 (282). Typical Mexicans under Diaz (281, 284, 285, 290). Died July 2, 1915, in Paris (421 to 425).

Drake, Sir Francis, English courtier, naval officer and explorer, 1540?–1596; made many voyages to the West Indies (295 to 303), several being plundering expeditions; crossed the Isthmus of Panama and saw the South Sea, praying that he might "sail an English ship on that sea" (247, 248, 256); entered the Rio de la Plata (314); sailed through the Strait of Magellan (328); entered the harbor of Valparaiso (326) and destroyed Spanish ships; rounded the Cape of Good Hope (582, 583, 584); is said to have been the first man to bring to England the potato (166) and tobacco (112).

Eliot, Charles William, American educator and writer, President Emeritus of Harvard University, 1834—; born in Boston and his life was closely associated with that city (6, 7, 8).

Emerson, Ralph Waldo, American poet and philosopher, 1803–1882; born in Boston. Many of his lectures were given there (6, 7, 8).

Endicott, John, American Colonial Governor of Massachusetts, 1588–1665; Governor of Massachusetts in Boston (6, 7, 8).

Evans, Robley Dunglison, United States admiral, 1846–1912. After his father died he went to live in Washington (90, 93) with his uncle. Upon his recommendation, steel was adopted for the construction of United States vessels (100, 242, 254); spent some time in the mills at Pittsburgh, Pa. (61 to 67) testing and inspecting steel. In 1891 in command of the *Yorktown* in Valparaiso Harbor (326, 327), he demanded an apology from the Chilians within twenty-four hours or he would fire; the apology came and he got the name "Fighting Bob Evans"; he was in command of one of the ships in the battle of Santiago (299); was put in command of the American fleet on its trip around the world (585); left Hampton Roads (100) on Dec. 12, but because of illness retired when the fleet reached San Francisco (230).

Farragut, David Glasgow, noted American admiral, 1801–1870; on Feb. 21, 1862, sailed out of Hampton Roads (100); on the night

of the 23d of April, 1862, broke through the obstructions and ran up the Mississippi River to New Orleans (119), which surrendered April 25.

Ford, Henry, American manufacturer, 1863—; went to Detroit in 1887 and organized the Ford Motor Company in 1903; now has 20,000 employees (152); in December, 1915, organized the "peace expedition" which went to Stockholm (416 to 418) and Copenhagen (404 to 406) but had no results.

Franklin, Benjamin, American statesman, diplomat and philosopher, 1706–1790. Old as these buildings are, not one of them was standing when Benjamin Franklin ran away from Boston in 1720, yet he took a large part in the struggle for freedom with which these buildings were associated (6 to 8). In 1762 he was sent to England (348 to 352) on behalf of the colonies to oppose the Stamp Act and other oppressive legislation; member of the Second Continental Congress and signed the Declaration of Independence (80 Liberty Bell in Independence Hall); in 1776 Minister to France and succeeded in making an alliance with that country; also helped to make the Treaty of Paris (421 to 425) which ended the Revolutionary War; invented the lightning conductor and made many discoveries in electricity (159, 165).

Fremont, John C., American explorer, general and statesman, 1813–1890; born in Savannah (106); made four expeditions to California and Oregon (221 to 242) and planted the American flag on the Pacific Coast; served as Senator from California (87); was Governor of Arizona (206 to 209).

Fuller, Melville W., Chief Justice of the United States, 1832–1901; was a prominent lawyer of Chicago (139); made Chief Justice of the United States Supreme Court (89) by President Cleveland; in 1899 went to Paris (421 to 425) as a commissioner to settle the dispute over the boundary between Venezuela and British Guiana.

Fulton, Robert, inventor of steamboat, 1765–1815. At the age of twenty-two, Fulton went to London (348 to 352) to study painting; spent seven years in Paris (421 to 425). While here he invented a submarine which French, British and American governments refused to adopt; in 1806 returned to New York (25 to 30); in 1807 launched the **Clermont** on the Hudson (39).

Funston, General Frederick, American soldier, 1865–1917; in 1890 special agent for the Department of Agriculture (93); accompanied expeditions to Alaska (243 to 246) and the British Northwest (274 to 276); in the war with the Filipinos he captured Aguinaldo (546 to 553); in 1914 commanded the expedition which took Vera Cruz (280); in 1916 was with the American army on the Mexican border (126, 211).

Garfield, James Abram, President of the United States, 1831–1881;

member of Congress (87, 88); President of the United States (91).

Garrison, William Lloyd, noted American abolitionist, 1805–1879; was dragged through the streets of Boston (6 to 8) by a mob that threatened his life because of his anti-slavery utterances. Negroes for whose freedom he spent his life's work (111, 117, 118).

Goethals, George Washington, American major general, army engineer, builder of the Panama Canal, 1858—; born at Brooklyn (27); in 1880 graduated from West Point and in 1885–1887 was assistant professor of military engineering (39); in 1907 took charge of the canal zone (247 to 256) and when the canal was completed was its first civil governor; in 1916 was chairman of commission to hear and pass on questions arising between railroad employers and employees (43, 129).

Gordon, Rev. Chas. W. (Ralph Connor), American preacher and author, 1860—. Scenes in the Rocky Mountains (274 to 277) where Connor did mission work and about which he wrote. Winnipeg (273) where he is a minister of the Presbyterian Church.

Gorgas, William Crawford, Major General, American expert on sanitation, 1854—; from 1898 to 1902 chief sanitary officer of Havana (295); from 1904 to 1913 had charge of sanitary administration in Panama (247 to 256), exterminating yellow fever and bubonic plague and reducing typhoid and malaria over 50%.

Grant, Ulysses Simpson, American general and 18th President of the United States, 1822–1885; educated at West Point (39); served in the Mexican War (280, 283). On Nov. 24, 1863, Gen. Hooker, under Gen. Grant, seized the top of Lookout Mountain (114). Grant's presence at Chattanooga inspired the Union army with boundless enthusiasm. Down this avenue (90) his victorious troops marched at the end of the war. He became Secretary of War (92) under President Johnson. He served two terms as President (91).

Hamilton, Alexander, American statesman and financier, 1757–1804; educated in New York (25 to 30); on July 6, 1774, attended a great meeting in the fields (now City Hall Park) (28) and made an impassioned speech which brought him into notice; was with Washington at Newburgh (37); was a member of Continental Congress meeting in old Federal Hall, New York, and served as Secretary of the Treasury under Washington (29); vigorously supported the constitution under which our government now works (87 to 93); while Secretary of the Treasury he advised and effected the purchase of West Point (39); under him the mint in Philadelphia was established (84).

Hawthorne, Nathaniel, American author, 1804–1864; held a position in the Customs House at Boston (6, 7, 8); President

Pierce made him consul to Liverpool (347); made many visits to the Lake District, England (361, 362); in Italy, especially in Rome (450 to 459) he found the material for "The Marble Faun."

Hay, John, American statesman, diplomat and author, 1838–1905; private secretary to President Lincoln (91); was secretary of the United States Legation in Paris (421 to 425) and Chargé d'Affaires in Vienna (462, 463); Ambassador to England (348, 349); was First Assistant Secretary of State under President Hayes and Secretary of State under Presidents McKinley and Roosevelt (92).

Hoover, Herbert C., American mining engineer, 1874—. Mr. Hoover was the first student to enter Leland Stanford University. After graduating from the geology and mining department he took work in San Francisco (230) under Mr. Lewis Janin. His work in mining took him to California (228 to 242); Oregon (221 to 225); Idaho (190); Wyoming (191 to 197) and Arizona (206 to 210). After a few years in Australia he was invited to become director of mines in China (513 to 524) and was there during the Boxer uprising. As junior partner in a London (348 to 352) house from which one of the partners stole a million of money, Mr. Hoover insisted that all claims should be made good. He was made head of the Belgian Relief Service (395 to 398). In August, 1917, was appointed United States Food Commissioner (104, 105, 118, 147, 166, 177, 184, 218, 233).

Howe, Samuel Gridley, American philanthropist and reformer, 1801–1876; born in Boston (6 to 8); later devoted his life to the education of the blind in that city. Stirred by the poems of Byron, he served as a surgeon in the Greek struggle for freedom (475, 480); studied medicine in Paris (421 to 425); in Berlin (383, 384, 385) engaged in helping Polish refugees he was secretly imprisoned for several weeks; was interested in the plans of John Brown but disapproved of Brown's raid on Harper's Ferry (101).

Howells, William Dean, American writer, 1837—; in 1861 to 1865 consul at Venice (457); from 1866 to 1881 editor of the *Atlantic Monthly* in Boston (6 to 8); from 1886 he has lived in New York (25 to 30) where he became connected with *Harper's Magazine* and did much literary work.

Huerta, Victoriano, President of Mexico, 1854–1916. Huerta was a full-blooded Mexican Indian (285); in 1913 as President in Mexico City (282) he arrested half the deputies and dissolved the Mexican Congress; then the Americans took Vera Cruz (280) and Huerta left for Spain (433, 438); returned to New York City (25, 26); was arrested trying to return to Mexico by way of New Mexico (211).

Irving, Washington, American author, 1783–1859; was born in New

York and loved to write about it (25 to 31); wrote a biography of Washington for whom he was named (9, 37, 93). These places which he knew and loved so well furnished the background for such stories as "Rip Van Winkle," the "Legend of Sleepy Hollow," etc. (36, 38, 39). For some time he was secretary to the American Legation in London (348 to 352); from 1842 to 1846 Minister to Spain (435); had his home in the Alhambra (436) and wrote its history and the legends connected with it. While in Spain he collected the material for the biographies of Columbus and Mahomet. He spent his last days at his home on the Hudson River (38) and lies buried in the cemetery at Sleepy Hollow (36).

Jefferson, Thomas, writer of Declaration, third President of the United States, 1743–1826; wrote and signed the Declaration of Independence (80 Liberty Bell, Independence Hall); was Secretary of State under Washington (92); Vice-President from 1797 to 1801 (87); President for two terms (91). Scenes in the Louisiana Territory which was purchased by the United States under Jefferson (118, 119, 120, 170, 172, 173, 187, 188, 189, 198 to 205).

Lansing, Robert, American statesman, 1864—; lawyer in New York City (25 to 31); in 1915 became Secretary of State under President Wilson (92).

La Salle, René Robert Cavelier de, Sieur, French explorer, 1643–1687; came to Montreal from France (266); discovered the Ohio River (61), at what point is not known; passed up and down the Niagara River more than once (49, 50); went down the Mississippi River (148, 170, 174) in 1682. The Delta was reached April 6 and the men, divided into three bands, went to the Gulf (120). Ordered to Paris, he was received with favor (421, 425).

Laurier, Sir Wilfred, Canadian statesman, 1841—; attended McGill University at Montreal (267); was a member of Quebec Legislature in 1871 (264); from 1896 to 1911 was Premier of Canada (262 to 277).

Lee, General Robert E., Commander of the Confederate Army, 1807–1870; graduated from West Point (39); married the granddaughter of Martha Washington (96); became assistant to the chief engineer of the army at Washington (90); took charge of the defenses of New York City (25); arranged the batteries in the attack of Vera Cruz (280); at Chapultepec received promotion for bravery (283); in 1852 was superintendent at West Point (39); commanded the United States troops which suppressed the John Brown raid (101); commanded the Confederate troops at Gettysburg (73).

Lincoln, Abraham, emancipator of slaves, 16th President of the United States, 1809–1865. No man could have had a much humbler birthplace than Lincoln's (113). He was once a member of the House of Representatives from Illinois (88); was twice

elected President (91); his Gettysburg oration was one of the great speeches of the world (73); his Cabinet containing Seward, Stanton, Chase and Welles was a wonderful collection of great men (92). Lincoln, the lover of freedom, even yet inspires men of all nations to work and fight for democratic ideals (146 Joffre at Lincoln's tomb).

Longfellow, Henry Wadsworth, American poet and educator, 1807–1882. Longfellow's home (9).

Lowell, James Russell, American poet and educator, 1819–1891; Ambassador to Spain in 1877 (435); Ambassador to England from 1880 to 1885 (348 to 352).

Magellan, Fernando de, a Portuguese; was an explorer in service of Spain, 1480?–1521; was in Rio Janeiro (305 to 307) in December, 1519; in February, 1520, reached the entrance to the Rio de La Platte (314); was the first European to pass the straits which bear his name (328); visited various islands in the Philippines (546 to 553) and there was killed.

Marshall, John, most famous American jurist, 1755–1835; congressman in the old federal building when the United States capital was New York City (29); was Secretary of State under John Adams (92); by Adams was appointed Chief Justice (89) of the United States which position he held thirty-four years; refused to become Minister to France but was sent to Paris (421 to 425) as a special envoy.

Maximilian — Ferdinand Maximilian Joseph, Archduke of Austria and Emperor of Mexico, 1832–1867; belonged to the royal family of Austria, was placed in Mexico by the French (462, 463). Chapultepec (283) was his palace. The people rebelled, Mexico City (282) was taken and Maximilian was executed.

McKinley, William, 24th President of the United States, 1843–1901; member of Congress (87, 88); was elected President, the gold standard being the important campaign question (91). On Feb. 15, 1898, the *Maine* was blown up in Havana Harbor and this brought about the Spanish War (296). Admiral Dewey sailed from Hongkong to Manila where he defeated the Spanish, May 1, 1898 (514, 546, 547). On July 3, the battle of Santiago was won by the United States (299). As a result of the Spanish War, the United States acquired the Philippines (546 to 553), Guam (554), and Porto Rico (257), and Cuba (295 to 299) became independent under United States protection. During the Spanish War, he urged the annexation of Hawaii (259 to 261).

Meade, General George Gordon, 1815–1872; American soldier, in command of the federal troops at the battle of Gettysburg (73).

Montcalm de Saint-Véran, de, Louis Joseph, Marquis, French officer, 1712–1759; lost his life on the plains above Quebec (264).

Montgomery, Richard, American Revolutionary general, born in Ireland; 1736–1775; led an unsuccessful attack on Montreal

(267); with Arnold was repulsed from Quebec hence Canada remained an English territory (264, 266).

Muir, John, American geologist and author, 1838–1914; made careful study of the Yosemite Valley (228, 229); also explored Alaska glaciers (243, 244).

Peary, Robert Edwin, American explorer and discoverer of North Pole, 1856—. After many years succeeded in reaching the North Pole (342, 343).

Pedro II — Dom Pedro de Alcántara, 1825–1891; Emperor of Brazil (304, 311) from 1831 to 1889. Died in Paris (421 to 425).

Pershing, John J., American Brigadier General, 1860—; graduated from West Point in 1886 (39); took part in a Sioux campaign in Dakota, 1890, and later was commander of the Sioux Indian Scouts (182); was military attaché at Tokyo in 1905–06 (526); was in the Santiago campaign in the Spanish-American War (299); was a military commander in the Philippines (546 to 553); was in command of the troops which pursued Villa in Northern Mexico and of the first American troops that went to Europe in the World War, arriving in Liverpool July 8, 1917 (347). A special train carried him to London (348, 352). On July 13, 1917, he, with his army, went to Paris, where they were received by a detachment of the French army (421, 426). The Avenue des Champs Elysees, down which Pershing went to the Place de la Concorde (422).

Pizarro, Gonzola, 1505?–1548, and **Francisco,** 1470?–1541, Spanish conquerors of Peru. In Panama with Balboa (247 to 256). Conquered the Incas. Gonzola Pizarro died in Cuzco (331).

Poe, Edgar Allan, American poet, 1809–1849; born in Boston (6 to 8) Jan. 19; entered West Point but was expelled (39); did literary work in New York City (25 to 30).

Ponce de Leon, Juan, Spanish explorer, 1460?–1521; in 1510 was made governor and empowered to conquer Porto Rico (257, 258); in 1513 discovered and explored Florida (108 to 111).

Raleigh, Sir Walter, English explorer and colonizer, 1552–1618; first attempted to colonize America and gave the name Virginia to the new country (100, 98); first introduced the use of tobacco (112) into Europe; was beheaded after a long imprisonment in the Tower of London (349).

Rankin, Jeannette, American, first female member of Congress, 1882—; born on a cattle ranch in Montana (188); studied music in Seattle (220); later was a student in the School of Philanthropy, New York City (25 to 31). In 1916 she was elected member of Congress from Montana (87, 88).

Revere, Paul, American patriot, 1735–1818. Attended town meetings in Faneuil Hall (7). Old North Church (6) where the signal light was hung. Lexington, toward which he rode, rousing the minute men on his way (10). Old State House (8) where the Massachusetts Assembly resisted the English tyranny.

Rockefeller, John D., American oil magnate, capitalist and philanthropist, 1839—; first went into the oil business on borrowed capital (69, 70); in 1872 organized the Standard Oil Company and later the Standard Oil Trust (122, 123); his immense fortune has given him tremendous influence in the financial circles in the United States (29).

Root, Elihu, American lawyer and statesman, 1845—; in 1899, was Secretary of War for McKinley; in 1905 on the death of John Hay became Secretary of State (92); in 1906 attended the Pan-American Conference at Rio de Janeiro (305 to 307); visited the capitals of many other South American countries and helped to create a friendly feeling between them and the United States (314 to 316, 324, 325, 340); in 1917 headed the United States war commission sent to Russia (482 to 488).

Roosevelt, Theodore, American soldier, author and 25th President of the United States, 1858—; born and reared in New York City (25 to 31) and was police commissioner; in 1882 to 1884 was on a ranch in North Dakota (188); from 1895 to 1897 was Assistant Secretary of the Navy (90). The navy was ready for the war of 1898. With his Rough Riders he took part in the attack on Santiago (299); when he returned he became Governor of New York (25 to 50); as Vice-President presided over the Senate (87); on the death of McKinley became President (91); when the anthracite miners of Pennsylvania (74 to 79) struck, he interposed and secured arbitration; in the Boxer rebellion in China, sent United States troops which united with English, French, Japanese and German troops to rescue their representatives who were besieged in Peking (520). Under Roosevelt's orders our fleet made a trip around the world (585). In his administration treaties were made and work on the Panama Canal (247 to 256) was started. He encouraged reclamation and conservation (210, 224, 232). After his term as President he went hunting in Africa and doubtless witnessed scenes similar to these (577, 578). On the way home he was entertained by the German Kaiser (384), visited Paris (421) and was the especial representative of the United States at the funeral of Edward VII of England (348).

Saint-Gaudens, Augustus, American sculptor, 1848–1907; born in Dublin, Ireland (380); came to New York City (25 to 31) when six months old. Here he studied and here is to be found some of his best work. In 1869 he went to Paris (421 to 425). Also he studied in Rome (450 to 452).

Santa Anna, Mexican general, 1795?–1876. In 1822 he was commandant of Vera Cruz (280); attacked San Antonio and captured the Alamo in the war for Texan independence (126); was more than once President of Mexico (282); spent many years in exile in Jamaica (301), Venezuela (338 to 341), Cuba (295 to 299) and the United States.

Schurz, Carl, American general and author, 1829–1906. Carl Schurz

received his early education in Cologne (393); lived in Paris as a correspondent for German newspapers (421 to 425); in London (347 to 352) was a teacher; participated in the battle of Gettysburg (73); in 1861 was United States Minister to Spain (435); was Secretary of Interior for President Cleveland (92).

Scott, General Winfield, American general, 1786–1866; on April 26, 1847, captured Vera Cruz (280); on Sept. 13, won the battle of Chapultepec (283); on Sept. 14, entered the City of Mexico (282); ran for the presidency (91) but was defeated; on May 29, 1866, died at West Point (39).

Seward, William Henry, American statesman, 1801–1872; in 1849 was elected Senator of the United States (87); under President Lincoln and President Johnson was Secretary of State (92); negotiated the treaty for the purchase of Alaska (243 to 246) and after retiring from public life visited that country.

Sherman, General William Tecumseh, noted general, 1820–1891; graduated at West Point (39); took part in the three days' battle at Chattanooga (114); his famous march to the sea terminated at Savannah (106).

Stedman, Edmund Clarence, American poet and banker, 1833–1908; war correspondent for the *New York World* in the Civil War (28); secretary to Attorney-General Bates in Washington (90); entered Wall Street (29) as a broker and banker.

Stuyvesant, Peter, last Dutch Governor of New York, 1602–1682. The Dutch were attracted to this location by the beautiful harbor (25, 26, 27). The Dutch governors allowed the people of New Amsterdam no self-government. Stuyvesant was especially autocratic (28). This is the older part of New York City (29) that was occupied by the Dutch.

Taft, William Howard, American statesman and 26th President of the United States, 1857—; the first and probably the best Governor sent to the Philippines (546 to 553) by the United States; Secretary of War (90) under President Roosevelt and so had charge of the beginning of the Panama Canal; was President from 1909 to 1913 (91); under his administration the Panama Canal was largely built (248 to 256). The Payne-Aldrich Bill passed by Congress (87) and signed by the President caused widespread dissatisfaction.

Tarbell, Ida Minerva, 1857—. Was associate editor on *The Chautauquan* from 1883–1889; studied in Paris (421 to 425) from 1891–1894; editor on *McClure's Magazine* from 1894–1906 and since then on the *American,* living in New York City (25 to 31); in 1917 was appointed, by President Wilson, a member of the Women's Committee of National Defense with headquarters in Washington, D. C. (90); author of "Life of Lincoln" (113, 146) and of the "History of Standard Oil" (122, 123).

Taylor, Bayard, American traveler, author and poet, 1825–1878; a newspaper man on the staff of the *New York Tribune* (25 to

31); as a special correspondent of the *Tribune* went to California during the gold excitement (228 to 242); traveled through Egypt (558 to 569) and Syria (491 to 494); crossed India from Bombay to Calcutta (500 to 508); was with Commodore Perry when he first entered the ports of Japan (527). His description of his travels in Norway is one of his most interesting books (407 to 412). From 1862 to 1863 he was secretary to the American Legation to St. Petersburg and later Chargé d'Affaires there (482). He lived many years in Germany, married and died there. In 1878 he was Minister to Berlin (383 to 385).

Verrazano, da, Giovanni, Italian navigator, 1480?–1527; born in Florence (456); in 1524 sailed to America with the authority of the French king, and was probably the first European to enter New York Harbor (25).

Warren, General Joseph, American soldier, hero of Bunker Hill, 1741–1775; physician in Boston (6) before the Revolution; took part in the meetings at Faneuil Hall which were held by citizens in protest against British tyranny (7). In this work he was closely associated with John and Samuel Adams. In 1775 he was a member of the Provincial Assembly. Twice he made the speech on the anniversary of the Boston Massacre, which occurred in front of the State House (8). He contributed largely to the success of the Battle of Lexington (10).

Washington, George, "father of his country" and first President of the United States, 1732–1799. This is the home Washington loved. Here he lived and died and now lies buried (96). When sent to prevent the French from getting possession of the Ohio country, Washington built Fort Necessity near the confluence of the Allegheny and Monongahela Rivers (61). It was near here, too, that the battle between the French and the English under Gen. Braddock was fought. When he assumed command of the American army before Boston, he made his home in this house (9). The Declaration of Independence was a momentous event in the life of Washington. He was no longer fighting for his rights under the English government, but for complete independence (80 Liberty Bell, Independence Hall). He made many visits to West Point (38, 39) and conducted campaigns about the Hudson. Fortunately he was near and reached West Point shortly after Arnold's treason. In some of the operations about New York, he had his headquarters at Newburg (37). It was here he addressed the dissatisfied soldiers who suggested making him king. The New York Sub-Treasury stands on the site of the old federal building from whose balcony Washington took the oath of office (29). In his administration, Congress chose the site of the nation's capital (90).

Webster, Daniel, American statesman, 1782–1852. Daniel Webster studied law in Boston (6, 8). Later he removed to that city. Many times he spoke in Faneuil Hall (7). Served many years

in Congress as Representative and later as Senator (87, 88). Twice he was Secretary of State (92). He opposed the annexation of Texas (122 to 127) and the Mexican War (283).

Wilson, Woodrow, educator, historian and 27th President of the United States, 1856—; Governor of New Jersey (51 to 60); elected to the presidency in 1912 and again in 1916 (91); took up the custom of reading his messages to Congress (88); in September, 1916, the Adamson Bill was passed to prevent a strike. The President signed it and the Supreme Court declared it constitutional. It was the beginning of a new policy and an example of extreme centralization of power (43, 129, 88, 89). On April 6, 1917, the United States declared war on Germany (383, 384, 385). Ruthless submarine warfare was the immediate cause (242). The President advocated government control of all resources. No other President has taken so much power as has President Wilson (184, 166, 177, etc.). Commissions were sent from England and France to help coöperation (146).

Winthrop, John, first governor of Massachusetts, 1588–1649; resided in Boston (6 to 8).

Wolf, James, British general, 1727–1759; killed at Quebec (264).

Wright, Orville, American inventor of airplanes, 1871—. (426).

Wright, Wilbur, co-worker and inventor, 1867–1912. From their inventions have come the airplanes in use everywhere today (426).

Young, Brigham, American leader of Mormon Church, 1801–1877; in 1840 went as a missionary to Liverpool (347); in 1848 he led the Mormons to Salt Lake City (212) and selected the site for the Temple; in 1849 he was made Governor of the Territory of Utah (213).

THE OLD WORLD

Abraham, Hebrew patriarch about 2000 B. C; lived a nomadic life in Palestine (495, 497, 498).

Alcibiades, a native and statesman of Athens, 450–404 B. C. (475).

Alexander the Great, Macedonian general and statesman, 356–323 B. C. He quickly reduced Greece which rebelled upon his accession (476 to 480); greatly admired Athens (475) and sent to it some of the spoils of war; conquered Syria (492 to 494) and Egypt (561 to 568); founded the city of Alexandria (558).

Anthony, Mark, member of second Roman triumvir, and general, 83–30 B. C.; spent most of his life in Rome (450 to 452); listened to philosophers in Athens (475); in Egypt (558 to 569) he lived with Cleopatra and there died.

Aristides, a Greek statesman and general, 550?–467 B. C.; was born and died in Athens (475).

Aristotle, 384–322 B. C., the teacher of Alexander; was a philosopher at Athens (475).

Augustus, Caius Julius Cæsar Octavianus, Roman emperor, 63 B. C.–14 A. D. Rome (450 to 452), of which Augustus said, "I *found the city* built of brick and left it built of marble." Au-

gustus made Egypt (558 to 568) a part of the Roman Empire.

Bacon, Sir Francis, English statesman, Baron of Verulam, philosopher and author, 1561–1626. Bacon was born in London (348 to 352) and held many high offices there. He was impeached before the House of Lords for having received money for grants of offices and privileges (352) and sentenced to £40,000 fine and imprisonment in the Tower (349) during the pleasure of the king.

Balboa, Vasco Nunez de, Spanish explorer in America. See New World Biographies.

Balfour, Sir Arthur James, English statesman, 1848—; was a member of Parliament in 1874 and Prime Minister of England in 1902 (347 to 352). Was head of an English mission to the United States in 1917.

Beethoven, Ludwig van, German composer, 1770–1827. Beethoven was a native of Bonn (392); his early life was spent in Cologne (393); he studied in Vienna and there lived many years and did much of his best work (462, 463).

Bismarck-Schönhausen, von, Prince Otto Edward Leopold, celebrated German statesman and diplomat, 1815–1898. Berlin (383, 384) is where Bismarck was educated and had very great influence; he was Ambassador to Russia (482); was Ambassador to Paris (421 to 425); he built up the German army (385).

Björnson, Björnsterne, Norwegian author, 1832–1910. Copenhagen (404 to 406) where Björnson studied. Paris (421 to 425) and Rome (450 to 452) were frequently visited by him. Björnson's writings contain wonderfully real Norwegian people and places (407 to 411, 414).

Browning, Robert, English poet, 1812–1889; long time a resident of London (348 to 352); spent most of his married life in Florence (456); died in Venice (457); buried in Westminster Abbey (350).

Bruce, Robert, deliverer of Scotland, 1274–1329. From such homes came many of Bruce's men (373). "Scots wham Bruce hae often led" (366). Stirling Castle was a Scottish stronghold and near here at Bannockburn Bruce defeated the English (367).

Brutus, Marcus Junius, Roman politician, 85–42 B. C.; was born and lived in Rome (450 to 452); escaped to Athens (475) after the assassination of Cæsar.

Bryce, James, Viscount, British statesman, diplomat and author, 1838—; was born in Belfast (381); lived in Washington (87 to 95) as English Ambassador.

Burke, Edmund, British author, orator and statesman, 1729–1797; was born in Dublin (380); contributed largely to the improvement of the government of India (500 to 507); prepared the way for the abolition of the slave trade (570, 572, 578). The Revolutionary War would never have taken place if Burke's policy of reconciliation had been followed (80, 10).

Burns, Robert, Scotch poet, 1759–1796. Burns' cottage, room where

the poet was born (372). Such homes inspired "The Cotter's Saturday Night" (373). "Scots wha hae wi' Wallace bled," wrote Burns (365, 368). He visited Edinburgh (365) where he was well received.

Byron, Lord, George Gordon, British poet and traveler, 1788–1824; was born in London (348 to 352); spent much time in Italy (457); visited and wrote about Constantinople (472 to 474); espoused the cause of the Greeks in their struggle for freedom and died in Greece (475, 470).

Cæsar, Caius Julius, Roman general and statesman, 100–44 B. C. Rome still contains many buildings that were there in Cæsar's time (450, 451). He attended games in the Coliseum (452) and there gave great spectacles to win public favor; led his army across the Alps into Gaul (427, 428, 441, 444 to 446, 448, 449); captured Marseilles (429); spent some time in Egypt (558 to 568) where he secured the throne to Cleopatra.

Calvin, John, French reformer, 1509–1564. Calvin was educated in Paris (421 to 425); went to Strassburg when expelled from Geneva; in this city (389) he married.

Carlyle, Thomas, British essayist, historian and philosopher, 1795–1881; was educated in Scotland, lived and worked in Edinburgh, (365).

Cato, Marcus Porcius, Roman censor, 234–149 B. C.; lived in Rome (450, 451, 452).

Chamberlain, Joseph, British statesman, 1836–1914; was born in London; was a member of Parliament and held high government positions (348 to 352); one of the commissioners sent to Washington (87 to 91); as colonial secretary was interested in the passage of the Australian Commonwealth act (585 to 589); visited South Africa (579 to 582) after the Boer War.

Champlain, Samuel de, French explorer in America. See New World Biographies.

Charlemagne, King of Franks and Emperor of Rome, 742–814; was crowned in St. Peter's at Rome (450, 451).

Charles VIII, King of France, 1470–1498. He ruled in Paris (421 to 425). Took Naples, Italy (453, 454).

Charles XII, King of Sweden, 1682–1718. Capital of Sweden (416, 417). Besieged Copenhagen (404 to 406); unsuccessfully led his army against Moscow (483); fled to Constantinople (472 to 474) after defeat at Polatva.

Chephren, Egyptian King, about 2700 B. C.; built the second great pyramid (565).

Cicero, Marcus Tullius, 106–43 B. C.; celebrated Roman statesman and orator; lived in Rome and attended games in the Colosseum (450 to 453).

Cleopatra, Queen of Egypt, 69–30 B. C.; ruled in Egypt (558 to 569); lived a short time with Cæsar in Rome (450 to 452).

Columbus, Christopher, discoverer of America. See New World Biographies.

Confucius, Chinese religious teacher, 551–478 B. C. Scenes in China where Confucianism is a prominent religion (513 to 524).

Constantine the Great, Emperor of Rome, 272–337; ruled Rome (450 to 452); made Constantinople (472 to 474) capital of the Empire.

Cortez, Hernando, conqueror of Mexico. See New World Biographies.

Cromwell, Oliver, Protector of England, 1599–1658. He became ruler of England when Charles I was beheaded in the Tower (349). Cromwell interfered by force with the actions of Parliament (352). Jamaica (301) was captured by the English under Admiral Penn while Cromwell was Protector of England.

Dante, Alighieri, Italian poet, 1265–1321; born in Florence (456); spent some time in Rome (450 to 452); sent on a mission to Venice (457) and fell ill when returning. In 1309, he was supposed to have visited Paris (421 to 425).

Darwin, Charles Robert, English naturalist and author, 1809–1882; attended college in Edinburgh (365); made scientific studies in Martinique and Jamaica (301, 300); made studies of South America (307, 304, 321); is buried in Westminster Abbey (350).

David, Hebrew poet and king, about 1100 B. C. He built Jerusalem, "the city of David" (495). Views of the country over which David ruled (496 to 498). Damascus, subjugated by David (493).

Demosthenes, Greek statesman, world's greatest orator, 384 or 385–322 B. C. Athens (475) where Demosthenes opposed Philip.

De Soto, Hernando, Spanish adventurer and explorer. See New World Biographies.

Dickens, Charles, English novelist, 1812–1870. London (348 to 352) where Dickens lived and whose life he portrayed. He is buried in Westminster Abbey (350).

Disraeli, Benjamin, Lord Beaconsfield, English statesman, 1804–1881; born and died in London (348 to 352); acquired control of the Suez Canal for the English (559); proclaimed Queen Victoria "Empress of India" (499 to 508) the first time that title was used. The Transvaal (579, 580) was annexed by England under Disraeli. In 1878 he entered the House of Lords (352) as Earl of Beaconsfield.

Drake, Sir Francis, English courtier, naval officer and explorer. See New World Biographies.

Edward the Confessor, King of England, 1004?–1066; built Westminster Abbey (350). It has been remodeled.

Edward II, King of England, 1284–1327; crowned and deposed in Westminster Abbey (350); defeated by Robert Bruce at Bannockburn (367).

Edward III, King of England, 1312–1377; crowned in Westminster Abbey (350).

Elijah, Hebrew prophet, about 900 B. C.; warned Ahab the King in

Jerusalem (495); the Jericho road (496) along which Elisha followed Elijah until he was translated.

Eliot, Sir John, English patriot, 1592–1632. Tower of London in which he died (349).

Elizabeth, Queen of England, 1533–1603; imprisoned in this tower (349) by her sister, Queen Mary. Here also her mother had been beheaded. Crowned and buried in Westminster Abbey (350). Traitors were hanged from London Bridge (348) in Queen Elizabeth's day. Virginia (100) named in her honor.

Ferdinand, 1452–1516, and **Isabella,** 1451–1504, King and Queen of Spain; took the Alhambra Palace at Granada (436); became rulers of Naples (453, 454) in 1504.

Francis Joseph I, Emperor of Austria-Hungary, 1830–1917; born at Vienna (462, 463). Early in his reign, 1848 to 1849, Hungary fought for independence but was defeated. Later the Austria-Hungary state was formed (464, 463). Scenes in Lombardy which Francis Joseph was compelled to cede to Italy in 1866 (458, 459).

Frederick I, surnamed Barbarossa, Holy Roman Emperor, 1121–1190; in 1155 marched to Rome and was crowned in St. Peter's (450, 451); took Milan twice, the second time he razed the city (458).

Garibaldi, Giuseppe, Italian patriot and soldier, 1807–1882; born at Nice, the son of a sailor (431); took part in the struggle made by Uruguay (312, 313) against the Argentinean dictator, Manuel Rosas; joined the Revolutionary government at Rome (450 to 452); he and his wife fled in a small fishing craft to Venice (457) and his wife died from the hardship; fled to Tunis (557); later lived in New York (25 to 31); in 1860 helped in the revolt of Sicily and entered Palermo (455); entered Naples (454) with only one or two friends to prove that he was a liberator, not a conqueror. It is largely through his efforts that Italy as a nation was unified (450 to 459).

Gautama (the Buddha), philosopher and religious teacher of India, middle of sixth century. Followers of Buddha bathing in the sacred Ganges before the Temple of Benares (501) where he began his preaching. Views in India and China where the teachings of Buddha have had the greatest influence (499, 500, 504, 513 to 524).

Gladstone, William Ewart, English statesman, 1809–1898; born at Liverpool (347); as member of Parliament, Chancellor of the Exchequer, British Premier, he was for nearly half a century the greatest man in London (348 to 352).

Goethe, Johann Wolfgang Von, German poet, 1749–1832; studied law at Strassburg (389) although he lived his life at Weimar; Venice (457) and Florence (456) received only short visits, so eager was he to reach Rome; remained a year in Rome (450, 451, 452); also visited Naples (453, 454) and Sicily (455). The

Rhine valley and German people figure largely in Goethe's writings (389 to 393).

Goldsmith, Oliver, British poet, born in Ireland, 1728–1774; attended Trinity College in Dublin (350); ran away to Cork (375) because he was involved in a college riot; in Edinburgh (365) studied medicine. The last years of his life were passed in London (348 to 352). In Westminster Abbey there is a monument to Goldsmith (350).

Gordon, Charles George (Chinese Gordon), English general, 1833–1885; in 1860 took part in the capture of Peking (519, 520); in 1872 was sent to Bulgaria (468, 469) as British Minister for regulating traffic on the Danube; was invited by the Khedive to be governor of Sudan (560). He was killed at Khartum.

Gustavus Adolphus, King of Sweden, 1594–1632; born at Stockholm (416, 417).

Hadrian-Publius Ælius Hadrianus, Emperor of Rome, 76–138; born in Rome (450 to 452); made Trajan governor of Syria (492, 493); he loved and spent much time in Athens (475). Castle of San Angelo was the tomb of Hadrian (451). Visited the Colossi at Memnon (567).

Haig, Sir Douglas, English general, 1861—; in 1899 and 1901 was in the Boer War in South Africa (580); later held a command in India (499 to 508); in the World War has had charge of English troops in France (426) succeeding General French.

Hastings, Warren, British statesman, 1732–1818; at the age of eighteen he went to Calcutta and later became the first viceroy of India (500); served as member of the Council in Madras (499); was impeached before the House of Lords (352).

Henry III, King of England, 1207–1272; rebuilt Westminster Abbey (350).

Henry VI, King of England, 1421–1471; crowned King of England in Westminster Abbey (350); crowned King of France in Paris (421 to 425) on Nov. 6, 1429; imprisoned in the tower (349).

Henry VII, King of England, 1457–1509; crowned in Westminster Abbey (350). The coasts of Labrador (278) and Newfoundland (279) were discovered by John Cabot in Henry's reign. This was the foundation of the English claim on America.

Henry VIII, King of England, 1491–1547; born at Greenwich (353); crowned in Westminster Abbey (350); made Wolsey Archbishop of York (360) and put into his hands almost supreme power. The Tower (349) where Anne Boleyn was beheaded.

Hindenburg, Paul von Beneckendorff und von, German general, 1847—. In 1916 Commander-in-Chief of the forces of the Central Powers (385).

Homer, Greek poet, between 900 and 1100 B. C. Homer described the life of the ancient Greeks (475 to 480). His poems were the foundation of Greek education.

Horace, Quintus Horatius Flaccus, Roman poet, 65–8 B. C. Horace

lived and wrote in Rome (450 to 452); studied the Greek poets in Athens (475).

Hugo, Victor Marie, French novelist, 1802–1885; spent much of his life and died in Paris (421 to 425); lived in Madrid in 1811 and 1812 (435); fled to Brussels (395) but was later expelled from that city; during his exile he lived in Jersey (364). Notre Dame Cathedral which plays so large a part in Hugo's writings (425).

Huxley, Thomas Henry, English scientist, 1825–1895. Lived in London (348 to 352) where he held position in Government School of Mines. Jointly with Tyndall he published a book on the movement of glaciers (427, 428, 446).

Ibsen, Henrik, Norwegian writer, 1828–1906. The Norway he described so wonderfully (407 to 409, 414). Scenes in Rome where Ibsen lived a long time (450 to 452).

Ivan the Great, first Czar of Russia, 1440?–1505. The Kremlin, the citadel of Ivan's capital, Moscow (483).

James I of England and VI of Scotland, 1566–1625; born in Edinburgh (365); in 1603 was crowned King of England in Westminster Abbey (350). The settlement of Jamestown was made during the reign of James I (100, 98).

Jesus, 0–33. Jesus grew to manhood in the city of Nazareth (497); traveled from Jerusalem to the Jordan, no doubt by the Jericho Road (496). "Two women shall be grinding corn. One shall be taken and the other left" (498). He was often in Jerusalem (495). It was in this city he was tried, condemned and crucified.

Joffre, Joseph Jacque Cesaire, Marshal of France, 1852—; in 1915 had command of both the French and English armies in France (426); in 1917 was special representative from France to America (146); later, in July, 1917, he welcomed General Pershing and the American troops to Paris (421 to 425).

Joseph, Hebrew ruler. Scenes in Egypt to which Joseph was carried as a slave and of which he became the ruler (565 to 568). Irrigation and farming in Egypt (561, 562, 564).

Josephus, Flavius, Hebrew historian, 37–? A. D.; born in and lived at Jerusalem (495); after the fall of Jerusalem he lived in Rome (450 to 452); Governor of Judea (496 to 498).

Joshua, Hebrew judge; led the children of Israel into the promised land, Palestine (495 to 498).

Kitchener, Horatio Herbert, Earl Kitchener, British soldier, 1850–1916. He was born in county Kerry, Ireland (377, 378); served in Egypt (558 to 569) and became second in command of the Egyptian army; captured Khartum and conquered the Sudan; went to South Africa as Chief of Staff to Lord Roberts; was in command of British forces in Boer War (580, 582); was Commander-in-Chief of the Indian army (499 to 508); in the war with Germany and Austria was lost in the

North Sea, his ship being destroyed, doubtless by a German submarine acting under orders from Berlin (384, 385).

Knox, John, Scottish reformer, 1505–1572; preached in Edinburgh (365).

Lafayette, Marquis de, French patriot; aided American Independence, 1757–1834; friend of Washington, made a journey to Mt. Vernon to show his respect (96); an honored guest in Washington (90 to 93, 87); was also warmly welcomed in New York (28); died in Paris, 1834 (421). The grandson of Lafayette, the Marquis de Chambrun, was one of the French war commissioners sent to the United States in 1917 (146).

LaSalle, Rene Robert Cavelier, French explorer. See New World Biographies.

Li Hung Chang, Chinese statesman, 1823?–1901. Scenes in China where he was practically next to the throne (513 to 524). In 1896 he represented China at the coronation of Emperor Nicholas II of Russia (482, 483); made a tour of the world, visited Germany (383 to 385), France (421 to 425), England (347 to 351) and the United States (87 to 95).

Livingstone, David, British missionary and explorer, 1813–1873; born in a humble Scotch home near Glasgow (373); explored the Zambesi River (575); discovered Victoria Falls (576). Scenes in the region where Livingstone explored and worked (577, 578). Buried in Westminster Abbey (350).

Lloyd George, David, English statesman, 1863—; opposed the Boer War (580); on Dec. 6, 1916, was made Prime Minister of England (347 to 352).

Louis IX, King of France, 1215–1270; ruled in Paris (421 to 425); while on a crusade was captured by Mohammedans in Egypt (558 to 569) in 1250; remained in Palestine (495 to 498) until 1252; went to Tunis (557) on his second crusade.

Louis XVI, King of France, 1754–1793. Paris (421, 423), capital of France and center of the French Revolution. Was marched down Avenue des Champs Elysees (422).

Luther, Martin, German reformer, 1483–1546; writings were burned in Cologne (393); made visits to Rome (450 to 452).

Macaulay, Thomas Babington, English essayist, historian, poet, and statesman, 1800–1859; member of the House of Peers (352); member of the Council for India (499 to 508).

Maccabæus, Judas, Hebrew patriot, second century B. C.; fought for liberty of Jerusalem (495); appealed to Rome (450 to 452).

Magellan, Fernando de, Portuguese explorer. See New World Biographies.

Marconi, Guglielmo, Italian electrical engineer, 1874—; invented the wireless telegraph now used all over the world (256).

Marie Antoinette, Queen of France, 1755–1793; born in Vienna (462); was taken down the Champs des Elysees (422) to prison and death.

Mary Stuart, Queen of Scots, claimant of English throne, 1542–1587. In Stirling Castle (367) Mary when a baby eight months old was crowned Queen of Scotland. She was reared in France (421 to 425), married to the Dauphin who died in 1560. Edinburgh was Mary's capital. Here she was honored as queen and to Edinburgh (365) she was brought as a prisoner; was mother of James I.

Maximilian, Ferdinand, Archduke of Austria and Emperor of Mexico. See New World Biographies.

Michelangelo Buonarroti, great Italian sculptor, painter and architect, 1475–1564; studied and worked in Florence (456). Rome contains much of his best work (450). St. Peter's church shows much of his genius (451). In 1529 he fled to Venice (457).

Miltiades, Greek general, died about 489 B. C. Athens (475) the city of Miltiades.

Mohammed, Arabian religious teacher and founder of Mohammedism, about 570–632. Views in Mohammedan countries (472 to 474, 503, 506, 555, 556, 560, 566).

Moltke, von, Helmuth Karl Bernhard, German statesman and soldier, 1800–1891. Received his military training in Copenhagen (404 to 406); resided and died in Berlin (383 to 385); reorganized the Turkish army in Constantinople (472 to 474); directed the siege of Paris in 1870 (421 to 425).

Montcalm, Louis Joseph, French officer. See New World Biographies.

More, Sir Thomas, author and chancellor of England, 1479–1852; was beheaded in the Tower (349).

Moses, the Hebrew lawgiver, about 1500 B. C. Scenes in Egypt where Moses was born and grew to manhood (561 to 569). Scenes in Palestine toward which he led the Israelites (495 to 498).

Mozart, John Wolfgang Amadeus, German composer, 1756–1791; lived and died in Vienna (462, 463).

Napoleon Bonaparte, French military genius and Emperor of France, 1769–1821. Notre Dame Cathedral where he was crowned (425). On May 15, 1796, he stood in Milan's Cathedral (458). Scenes near the Battle of the Pyramids (565, 566). Entered Vienna (462, 463) in 1805; entered Berlin (383 to 385) in 1806; closed the port of Hamburg to British trade (386); took Madrid (435) in 1808; found Moscow on fire Sept. 14, 1812, and was forced to retreat (483). Near Brussels the battle of Waterloo was fought (395).

Nelson, Horatio, Lord Nelson, English hero of Trafalgar, 1758–1805. Very near to Alexandria was fought the Battle of the Nile which prevented Napoleon's getting control of Egypt (558). He retired to Naples (454) after the battle of the Nile; gained a great naval victory at Copenhagen (404 to 406).

Newton, Sir Isaac, English mathematician and scientist, 1642–1727,

a great astronomer; by ingenious experiments with his telescope made discoveries with regard to light (593 to 600); is buried in Westminster Abbey (350).

Nogi — Count Nogi Maresuke, Japanese general in Russo-Japanese War, born 1849. Scenes in Japan (525 to 541) from which Nogi drew his army. Chinamen sawing timbers for the Japanese army (523).

Okuma, Count Shigenobu, Japanese statesman, 1838—. Tokyo, the Japanese capital, where he lives (526).

Patrick, St., Apostle to Ireland, 373?–463?; fleeing from slavery in Ireland was taken on board a French ship and carried to Marseilles, France (429). His bell is in the museum at Dublin (380).

Paul, the Apostle (the first century); born at Tarsus (491); became prominent in Jerusalem (495) first as a Jewish teacher and later as a Christian one; was converted while on his way to Damascus (493); preached in Athens (475); preached and wrote letters to the Corinthians (477); appealed to Rome (450 to 452) for trial and probably was executed there.

Pericles, Athenian statesman, 495?–429 B. C.; greatest statesman of Athens. Many of her most beautiful buildings were built under his directions (475).

Peter the Great, Czar of Russia, founder of St. Petersburg, 1672–1725; born at Moscow (483): founded Petrograd and made it the capital of his Empire (482).

Peter (Simon), Hebrew apostle (first century). Scenes in Palestine where Peter followed Jesus (495 to 498). He was taken a prisoner at Rome (450 to 452), where he was probably executed by Nero.

Pisistratus, Greek tyrant, 605–527 B. C. Pisistratus ruled Athens (475).

Pizarro, Gonzola and Francisco, Spanish conquerors of Peru. See New World Biographies.

Plato, Athenian philosopher, 427–347 B. C.; lived in Athens (475); traveled in Egypt (560 to 568).

Polo, Marco, Venetian geographer and writer, 1250–1324; belonged to a noble Venetian family (457); spent many years in China, which he described in his book (513 to 524).

Pompey — Cneius Pompeius Magnus, noted Roman general, 106–48 B. C.; lived in Rome (450 to 452); annexed Syria (492 to 494) to the Roman Empire; also reduced Jerusalem (495); was killed in Egypt (558 to 565) and his head was given to Cæsar.

Ponce de Leon, Juan, Spanish explorer in America. See New World Biographies.

Ptolemy I, King of Egypt, died 283 B. C. Scenes in Egypt where he ruled (558 to 568).

Raleigh, Sir Walter, English explorer and colonizer in America. See New World Biographies.

Rameses II, King of Egypt, maker of the first treaty known in the

world, 1340–1273; had a part in the building of the Temple of Karnak (568).

Raphael Sanzio, great Italian painter and sculptor, 1483–1520. Earliest work was done in Florence (456). St. Peter's and the Vatican contain much of his work (451). The cathedral of Milan contains some of his masterpieces (458).

Rhodes, Cecil J., South African statesman, 1853–1902; in 1870 went to South Africa (575 to 584); in 1871 went to the Kimberley mines (581); became Prime Minister of Cape Colony (582); was investigated by British Parliament concerning his share in the Jamison Raid (352). The one aim of Cecil Rhodes's life was to extend British rule in South Africa. Rhodesia (575 to 578) was named for him.

Richard I, the Lion-hearted, King of England, 1157–1199; crowned in Westminster Abbey (350); Jerusalem (495) and the Holy Land (497, 498) for whose freedom from the Saracens he fought.

Richelieu, Armand Juan du Plessis, Duke, French Cardinal, 1585–1642. Paris (421 to 425) where he was ruler in all but name. In Rome (450 to 452) Cardinal Richelieu was consecrated.

Roberts, Frederick Sleigh, Lord Roberts, celebrated English general, 1832–1914; Commander-in-Chief of the Queen's forces in the South African war between the English and the Boers (582, 580); Commander-in-Chief of the forces in India (499 to 508).

Robespierre, Maximilien Marie Isidore, French Revolutionist, 1758–1794. Paris (421 to 425) the scene of the French Revolution.

Rubens, Peter Paul, celebrated Flemish painter, 1577–1640; as a child lived in Cologne (393); studied art in Venice (457); also studied in Rome (450 to 452); was sent to Madrid on a diplomatic mission (435); in London conducted diplomatic business so successfully that he was knighted by Charles I (348 to 352); spent most of his life and died in Antwerp (396).

Rubenstein, Anton, Russian composer, 1830–1894. As a child he lived in Moscow (483); studied music in Paris (421 to 425); studied music and spent much of his life in Berlin (383 to 385); began teaching in Vienna (462, 463); lived and died in St. Petersburg (482).

Ruskin, John, English author, art critic and reformer, 1819–1900; born in London (348 to 352); traveled through the Alps and Italy (427, 428, 440 to 459); visited the Lake District (361).

Saul, first King of Israel, about 1050 B. C. Scenes in Palestine where Saul ruled (495 to 498).

Savonarola, Girolomo, Italian preacher and reformer, 1452–1498. Savonarola's life work was given to Florence (456).

Scott, Sir Walter, British poet and novelist, 1771–1832; born in Edinburgh (365) where he is honored by a great monument. Stirling Castle (367, 368). Everything that pertained to Scotch history or romance was a part of Scott's life. Ellen's Isle

(369) described in "The Lady of the Lake." Highlanders (366) such as these figure largely in Sir Walter Scott's writings.

Shakespeare, William, celebrated poet and playwright, 1564–1616. Shakespeare's birthplace (354). Anne Hathaway's cottage (355). Shakespeare's memorial theater (356).

Sienkiewicz, Henry, Polish novelist, 1846—; born in Warsaw, Poland (485); in 1876 visited California and wrote a description of the country (228 to 241). Rome under Nero (452) is the theme of his greatest novel, *Quo Vadis.*

Smith, Donald Alexander, Lord Strathcona and Mount Royal. It is due to Lord Strathcona more than to any other man that the Canadian Pacific was completed (267, 273).

Socrates, Athenian philosopher, 469–399 B. C.; did his teaching in Athens (475).

Solomon, Hebrew poet and king, about 1000 B. C.; built the temple in Jerusalem (495); Israel (496 to 498), the country over which he ruled.

Solon, Athenian lawgiver, 639?–559 B. C.; reformed laws of Athens (475).

Stuyvesant, Peter, Dutch Governor of New York. See New World Biographies.

Thackeray, William Makepeace, English novelist and art student, 1811–1863; born in Calcutta (500); studied art in Paris (421 to 425); lived and wrote in London (348 to 352).

Themistocles, Greek statesman, 514?–449 B. C. After the battle of Marathon, he persuaded the Athenians to build a fleet (475). He induced the Greeks not to retreat to Corinth in the Persian War (477).

Thorwaldsen, Bertel, Danish sculptor, 1770–1884; was born and lived in Copenhagen. Some of his best work was here (404 to 406). He studied in Rome (450 to 452). The Florence Academy appointed him a professor in 1840 (456).

Titian Vecelli, noted Venetian painter, 1477–1576. In Rome (450 to 452) Titian met and studied with Michelangelo and Raphael. In Vienna (462, 463) are some of his greatest works, the "Ecce Homo," etc. In Florence (456) some of his best work is to be found.

Titus — Titus Flavius Sabinus Vespasianus, 40–81. Emperor of Rome (450 to 452); destroyed Jerusalem (495). Mt. Vesuvius (453) in eruption buried Pompeii and Herculaneum in his reign.

Togo, Count Heihachiro, Japanese soldier and statesman, 1847—. In 1873 he was a student at Greenwich (353). In 1904 he was in command of the fleet which bombarded Port Arthur (522). He was a Japanese representative at the coronation of King George (350).

Tolstoy, Count Lev Nicolaevich, Russian author, reformer, philosopher, 1828–1910; lived in Petrograd (482). Scene in Russia where he lived and wrote (483).

Trajanus, Marcus Ulpius, Emperor of Rome, 53–117. Scenes in

Rome where he ruled (450 to 452). Damascus (493) which he incorporated. He added Roumania to the Roman Empire. Roumanians (470, 471) today call themselves "Romans."

Tyndall, John, British natural philosopher, 1820–1893. Studied the movement of glaciers (427, 428, 446) and wrote about them. Climbed the Matterhorn (448). He lived many years in London (348 to 352).

Venizelos, Greek statesman, native of Crete. His ancestors were Greeks whose home was at the foot of the Acropolis (475); in 1909 arrived in Athens (476) where he became Prime Minister and almost re-made Greece. In the Balkan wars it was his influence that united the Balkan States, Serbia (467), Bulgaria (468, 469) and Roumania (470, 471) with Greece (475 to 480) against Turkey (472 to 474). Later he united Serbia (467) and Greece (475 to 480) against Bulgaria (468, 469). Constantine, King of Greece, married a sister of the German Emperor, therefore sided with the Central Powers in the World War (384, 385, 476). Constantine dismissed Venizelos from office but the people reinstated him and Constantine with his court left for Switzerland (440 to 449). The Greeks under the leadership of Venizelos are allied with England (347 to 362), France (421 to 431), Italy (450 to 459), Russia (481 to 488), and America (1 to 261).

Vergil, Publicus Vergilius Maro, Roman poet, 70–19 B. C.; went to Milan (458) (known to the ancient Romans as Mediolanum) to study; continued his studies in Naples (454, 453) and was buried there; studied and later lived in Rome (450 to 452); visited Athens (475).

Verrazzano, Italian navigator. See New World Biographies.

Vespasian, Titus Flavius Sabinus Vespasianus, 9–79 A. D., Emperor of Rome (450 to 452); Governor of Egypt (558 to 568); began the siege of Jerusalem (495).

Victoria, Alexandriana, Queen of England, 1819–1901; crowned in Westminster Abbey (350). The House of Lords showing the seat of the Queen (352). London (348 to 351) where the Queen lived and ruled. Queenstown (374) was named for her at the time of her first visit to that city. Was proclaimed Empress of India (499 to 508).

Vinci, Da, Leonardo, Florentine painter, 1452–1519; educated in Florence (456); about 1483 he removed to Milan and was employed as an architect upon the Cathedral of Milan (458); in 1499 he removed to Venice (457); paid several visits to Rome (450 to 452); became court painter to Francis I of France and died in Paris (421 to 425), which city has a fine collection of his paintings.

Voltaire, François Marie Aronet, French free thinker and revolutionary writer, 1694–1778; was born and died in Paris (421 to 425); lived three years in Germany, the guest of Frederick the Great (384, 385).

Wagner, Richard, German musician and composer, 1813–1883; lived in Paris from 1839 to 1842 (421 to 425); in 1885 lived in London (348 to 352); died in Venice (457).

Wallace, Sir William, noted Scottish military leader and patriot, 1272?–1305. His one aim in life was to free Scotland from the English (368). Defeated the English at Stirling Bridge (367); was captured through the treachery of one of his own men and taken to the Tower of London and there beheaded (349). His head was hung on London Bridge (348).

Wellesley, Arthur, Duke of Wellington, British soldier, hero of Waterloo, 1769–1852; born in Dublin (380); a member of the House of Lords (352); took part in the great naval battle of Copenhagen (404 to 406); in 1812 with his troops occupied Madrid (435); served his country as Ambassador to France (421 to 425); was Plenipotentiary to Austria (462, 463); in the great battle of Waterloo just outside of Brussels he broke the power of Napoleon (395).

Wentworth, Thomas, Earl Stafford, English statesman, 1593–1641; member of the House of Lords and tried by it (352); was executed in the Tower of London (349).

William the Conqueror, King of England, 1027–1087; built the Tower of London (349); the first king of England crowned in Westminster Abbey (350).

William I, German Emperor, 1797–1888; accomplished the wonderful organization of the German army (385); considered himself a supreme power above that of the Reichstag (384); said he ruled "by the favor of God and of no one else." On March 21, 1871, he opened in Berlin the first Reichstag of the German Empire (383).

William II, Emperor of Germany, 1859—. The Royal Palace where the Kaiser lives (384). The laws of Germany are made here (383) and here are appropriated the billions of money which the Germans are using for the war. These are the soldiers with which Germany is fighting. William has made Germany into one great military machine (385). Germans did much damage with Zeppelins in the early days of the war (394). Such scenes do not take place during the war. The Kaiser's government has carefully regulated the food supply (387, 393). The River Meuse and Namur (397) have been in the front of the war. Over this ground the Kaiser's forces have struggled with those of the Allies. By this war the port of Hamburg (386) is blockaded and foreign commerce of Hamburg is entirely stopped. To retaliate, Kaiser William ordered the ruthless submarine warfare which forced the United States to enter the war. Over all this land (387 to 393) the Kaiser asserts that he is the divinely appointed ruler and that all these people owe to him absolute obedience.

William, 1650–1702, and Mary, 1662–1694. rulers of England; entered London Dec. 18, 1688 (348, 349); crowned in Westminster Ab-

bey (350). In their reign the Bank of England was founded (351).

Wordsworth, William, poet, 1770–1850. Lake District where he lived (361). Rydal Mount, his home (362).

Wren, Sir Christopher, English architect, 1632–1723; designed St. Paul's and many other churches in London and by many is thought to have planned the towers of Westminster Abbey (350).

Xenophon, Athenian general and historian, 434? B. C.–about 355? B.C. Born in Athens (475).

Yuan Shih-kai, first President of China, 1859–1916. Scenes in China (513 to 524) where Yuan Shih-kai was first President.

Zeppelin, von, Count Ferdinand, 1838–1917; German inventor of the Zeppelin flying machine used by the Germans (394).

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THE PUBLISHERS.

AGRICULTURE

INTRODUCTION

By CHARLES F. CURTISS, M.S.A., D.S.

DEAN DIVISION OF AGRICULTURE AND DIRECTOR OF THE EXPERIMENT STATION, IOWA STATE COLLEGE, AMES, IOWA.

"At the head of all the sciences and arts, at the head of civilization and progress, stands — not militarism, the science that kills, not commerce, the art that accumulates wealth — but agriculture, the mother of all industry and the maintainer of human life."

Never before in the history of the world has so much depended upon intelligent, efficient, and well conducted agriculture. The great International war has not only brought about a marked shortage of food stuffs which is world-wide in its scope, but the determination of the outcome and results of the war promise to depend quite as much on the industrial forces as upon military achievement. Chief among the industrial forces of all of the great nations are those relating to the production of food and clothing. Agriculture has taken on a new significance throughout the world in recent years. Improved machinery, motive power and transportation facilities have tremendously increased production and widened the market for agricultural products. One hundred years ago it was necessary, under conditions then existing in the United States, for about ninety per cent of all of the population to engage in agricultural occupations in order to maintain a production that would meet the needs of the country and sustain the population. Even as late as fifty years ago, about two-thirds of the population of the United States was engaged in agricultural pursuits. Today, scarcely more than one-third of our population is engaged in farming and, notwithstanding this marked change and the tremendous increase of city population, agricultural production has made great advance and the farms have, until within the past few seasons, not only yielded abundantly for our own population, but a large surplus has

been exported to foreign markets. The great development of the manufacturing and commercial interests of the country, coupled with the demands growing out of the war, has created new economic conditions that have given to agriculture and to food production a new significance and a larger importance throughout the world. The agricultural problem has become a national problem, not only in the United States, but in foreign countries as well. Government aid and encouragement in agriculture, as well as government direction and control of the distribution of food products on a fair and economical basis, will come about as an immediate result of the war conditions, but many of the policies inaugurated will have permanent results.

There is wide recognition of the need of thorough and efficient training for agriculture. This demand has become well nigh universal. Agriculture and home economics, or household science, are now required subjects in the public schools of most of the states, but the Smith-Hughes bill passed by the present Congress provides an extensive and far-reaching system of federal aid for vocational education that will give a tremendous stimulus to industrial education in the United States. Agriculture, home economics, and the trades and industries are to constitute the basis of the system of industrial education fostered by the government under this measure. It is probable that this policy will eventually exert greater influence upon the educational system of the United States than any federal legislation that has ever been enacted. Agriculture is a highly concrete, practical and definite subject. Agricultural education must be based upon principles and practice that are scientifically sound, and strong work in science should support all agricultural training, yet it is well known that agricultural education made but little progress until it was definitely connected up with concrete problems, in a practical way. This is one of the vital and most difficult problems that is encountered in extending agricultural instruction into the public school system of the United States. The Keystone View Company's "600 Set" of stereographs and lantern slides cover a wide range of most interesting material relating to agricultural education, and they will be of great service in effectually visualizing agricultural conditions and processes.

21. SOILS

By ALFRED VIVIAN, Ph.G.

DEAN COLLEGE OF AGRICULTURE, OHIO STATE UNIVERSITY, COLUMBUS, O. PRESIDENT BOARD OF EDUCATION FOR STATE OF OHIO

Without the soil we could not be living in this world today. The food which you eat could not be produced if there was no soil, for the plants which make the food for animals, in their turn derive all their nourishment from the soil. So, you see, the soil is after all very important to mankind.

We are so familiar with the soil as it now exists that most of us do not stop to consider that it was ever anything different, but it has really taken a long time for Nature to form what we call the soil, and in doing so she has employed the wonderful agencies about which something will be said in this article.

Most of you know that if you dig down deep into the soil you will come to solid rock. Sometimes rock is reached a few inches below the surface, and again you must dig many feet before you come to it, but sooner or later you are sure to find a bed of stone.

Soils consist for the most part of very fine particles of rock (rock powder) mixed with a small quantity of organic matter; i.e. the remains of plants which have formerly grown upon the land, and which have partially decayed or rotted in the soil. The rock powder was formed by the pulverization of the original rocks of the earth's surface, the grinding of the rocks being due to several forces.

1. SOIL MAKERS

(a) Action of Weathering

The alternate action of heat and cold upon the rock, especially when the rock is saturated with water, causes the rock to crack, and small pieces to chip off. These pieces in their turn are made smaller and smaller by the same action of heat and cold, freezing and thawing. Freezing and thawing split the rocks into pieces.

191 Yellowstone. Freezing and thawing split the rocks into pieces.
208 The Grand Canyon affords wonderful examples of weathering.
322 Chilean Andes. The softer parts of the stone are worn away first, leaving the harder points.
330 Cordilleras Mts., Peru. The bits of rock which are split off slide into the streams, and are carried away to form a soil elsewhere.
382 Giant's Causeway. The waves of the ocean also wear away the rocks.
440 Mt. Pilatus, Switzerland. Note the fine material loosened by weathering, which is sliding down into the valley below.

(b) Action of Running Water

Running water grinds the rock into flour, especially if the stream is swift enough to carry particles of sand or gravel which rub against each other and against the bed of the stream until the rock is worn away and ground to a powder. In this way deep valleys are sometimes cut into the surface of the earth, and the fine material is carried away to form a soil at some other place.

49 The water in Niagara Falls is gradually wearing away the face of the cliff over which it runs.
51 Palisades. Running water carves deep valleys in the face of the earth.
197 Yellowstone. This deep valley has been formed by running water.
207 Grand Canyon. The combined action of weathering and running water has formed this canyon, which is a mile in depth.
228 Yosemite. The material carried away by the streams is deposited somewhere to form a soil.
363 Bettws-y-Coed, Wales. When the stream is swift enough to carry boulders it wears the rocks more rapidly.
576 Victoria Falls. Such a rush of water carries large quantities of soil making material.

(c) Action of Glaciers

Another agency which helps to grind the rocks is moving ice in the form of glaciers. As the glacier moves along, it carries with it large quantities of rocks, grinding them against each other until they are reduced to particles of various degrees of fineness. When this material reaches the melting end of the glacier it is deposited, and the finest of the material is carried away by the glacial stream. A large part of the northern United States was once covered by a great glacier.

219 Paradise Glacier. The northern part of the United States was once all covered with a sheet of ice much thicker than this.
221 Mt. Hood. The glaciers of the present day give some idea of the action of the great glacier.
274 Victoria Glacier. Note the rock material which the glacier is carrying with it and which will be deposited at the end of the glacier as the ice melts.

275 Illecillewaet Glacier. The ice sheet in some of the glaciers is very thick and has great grinding power.
276 Mt. Sir Donald. The action of weathering, running water and glaciers can all be seen in this picture.
427 Glacier des Bossoms. Note the amount of material which has been carried down by the glacier. A young forest is growing on part of the "moraine."
428 Mer de Glace. Such a sheet of ice has great power to pulverize stone.
446 Switzerland is noted for its wonderful glaciers.
448 Showing the sharp weathered point of the Matterhorn with the glaciers at its base.

(d) Action of the Wind

The wind carrying particles of dust and sand and hurling them against the rocks gradually carves the rocks into odd shapes and grinds them to powder.

200 Phoebe's Arch, Palmer Lake, Col. The wind carried particles of sand which wear away the softer parts of the rock.
201 Cathedral spires. Garden of the Gods. The wind carves the rocks into fantastic shapes.

(e) Action of Volcanoes, etc.

To a more limited extent volcanoes take part in soil formation by means of the ashes and lava which they throw out during eruptions. The soluble materials brought up by the hot springs, and the mechanical action of the earthquakes are of minor importance.

453 Mt. Vesuvius. Some soils consist almost entirely of lava from the volcanoes.
222 Crater Lake. The crater of an extinct volcano gradually being filled by the weathering of the side walls.
192 Yellowstone. The soluble material in the water of the hot springs is deposited as the water cools.
194 Old Faithful Geyser. Note the cone formed by the material deposited from the water of the geyser.
231 Earthquake fissure. In some few cases the surface of the soil is affected by earthquake action.

2. TYPES OF SOILS

(a) Classification as to Origin

Soils are designated as "residual," when the soils are formed from the underlying rock without being moved away or as "transported," when they are deposited at some distance from the rock from which they are formed.

515 Yangtze River. Soils which are transported by water and are deposited in the river valley are called "alluvial" soils. They are generally rich soils.
321 Mendoza River. The flat land near the river consists of alluvial soils.

262 Acadian Land. The alluvial soils of the lowlands are generally very productive.

408 Jordal Valley, Norway. In mountainous countries only the soil in the bottom of the valleys can be cultivated.

427 Chamonix, France. Soils which are transported by glaciers are known as "drift" soils. They usually contain much gravel composed of round particles of stone. Note the accumulation of "drift" at the foot of the glacier.

275 Illecillewaet Glacier. Soils which are transported by the wind are known as "loess" soils. A large part of the soils in the corn belt of the United States consist of loess. Note in this picture the particles of dust which the wind has deposited even at the top of the glacier.

322 Inca Lake, Chile. Lakes are gradually filled by the soil washed down from the surrounding high lands.

453 Mt. Vesuvius. Some soils are formed directly from the ashes and lava deposited by volcanic action.

(b) Classification as to Composition

Soils consist largely of four ingredients, sand, silt, clay and organic matter. When they contain considerable amounts of organic matter they are known as "loams." The individual particles of clay are very fine and a soil consisting largely of clay is very sticky when wet and very hard when dry. It is the most difficult soil to cultivate. Sand is lacking in plant food. The silt particle is intermediate in size between sand and clay. Some of the best soils contain a large proportion of silt. The organic matter consists largely of the more or less decayed remains of plants which have formerly grown on the soil. Soils are given various names, depending on the relative amounts of the four ingredients which they contain, such as sandy, sandy clay, silty, clay, sandy loam, clay loam, silty loam, etc. Soils which are very high in organic matter are called peat or muck soils.

357 Wheat thrives on a clay loam soil with rather a high proportion of clay. Farmers sometimes speak of such soils as "strong" soils. Wheat must have an abundance of available plant food.

147 Oats will grow in a variety of soils, but do best in a cool climate.

136 Indian corn, or maize, thrives on a loose, fertile, well-drained soil. It is at home in the silty loam soils, such as the loess of the corn belt.

47 Melons are usually grown on sandy loams. They will stand a large proportion of sand.

149 Harvesting celery. The soils formed in swamps and the bottoms of old lake beds usually contain a large percentage of organic matter and are called muck soils. They are adapted to celery and onions. Such soils must be well drained.

223 Sand dunes. Very sandy soils are so loose that they drift before the wind and are difficult to control. They are also very low in plant food.

183 Alfalfa. Such plants as clover and alfalfa will grow only in soils

which contain an abundance of limestone. If limestone is lacking in the soil it must be added before these crops can be grown. Soils formed from limestone are usually very fertile.

3. SOIL MANAGEMENT

(a) Clearing the Land

A large part of the cultivated land of the world was at one time covered by forests, and the trees had to be removed before the ground could be tilled and planted.

224 Felling tree, Oregon. Much labor and expense is involved in clearing such a piece of land.

(b) Tillage — Plowing

The oldest and most important tillage operation is that of plowing. The effect is to loosen the soil and to turn under manures and rubbish. The plow is the oldest tillage implement, varying from the ancient crooked stick to the modern gang plow with its steel mold-board.

561 The plow of Egypt is as old as the Pyramids themselves.

298 Cuban plow. The first plow was merely a pointed stick.

522 The agriculture of China is very ancient, but its plow is still the pointed stick.

488 Russian plowing. This plow is better than the pointed stick because it will turn a furrow.

178 Tractor plow. The modern steel plow turns the soil and leaves it in much better condition than does the ancient plow.

(c) Tillage — Harrowing

After the land is plowed the harrow is used to break the clods and make the surface smooth.

179 Making good seed bed. The soil should be thoroughly pulverized after it is plowed.

332 Preparing the soil, Peru. Note the fine condition of the seed bed.

549 Filipino harrowing rice field. For rice the land is sometimes harrowed under water.

(d) Tillage — Cultivation

Certain crops are planted in rows and the soil is hoed and otherwise cultivated between the rows in order to kill the weeds, and to prevent the loss of moisture by forming a layer of loose soil on the surface ("dust mulch").

105 Hoeing rice. The hand hoe is an effective implement with which to destroy weeds.

198 Cultivating beets. The horse cultivator covers the ground much faster than can be done by hand.

419 Women weeding beets. Hand weeding is necessary with some crops.

(e) Tillage — Dry Farming

In regions of scanty rainfall, crops are sometimes grown every other year, the surface of the soil being constantly stirred during the non-

cropping year so as to conserve the moisture of two years for one crop.

199 Wheat raised by dry farming method. Dry farming greatly increases the crop yield in areas of scanty rainfall.

(f) Irrigation

Growing crops use enormous quantities of water, 900 tons or more to the acre. In lands of insufficient rainfall the fields are artificially irrigated and in many places large dams and reservoirs are constructed to supply the water. Some crops like rice have to be flooded with water during a part of the growing season.

569 Assuan Dam. This great dam was built to provide water to irrigate the farms in the Nile valley.

104 Rice land is covered with water during part of the growing season.

527 Note the patches of rice which are growing in the standing water.

(g) Drainage

Some soils contain so much water that the excess must be removed by means of ditches or tile drains. In Holland the water is collected in canals and pumped out by windmill power.

399 The canals of Holland serve to drain the land and are also used for transportation.

(h) Fertilizing — Farm Manures

Constant cropping removes the plant food from the soil, and if more food is not added the soil soon fails to produce a profitable crop. Much of the plant food removed by the crops can be returned to the soil if the manure of the farm animals is spread on the ground and plowed under. When the crops are fed in the field, as in the case of "hogging down" corn or pasturing sheep and other animals, the manure is left on the ground and helps to maintain the fertility of the soil.

159, 165 Group of dairy barns. The manure from cattle is the best fertilizer.

57 The dairy cow is a great help in maintaining the fertility of the soil.

180 The manure spreader is almost indispensable on a farm.

183 Hogs in alfalfa pasture. A good way to maintain fertility is to feed the crops in the ground. This is what is known as "hogging down" alfalfa.

172 Hogs in rape field. This field will produce a large crop following the "hogging down" of the rape.

173 Sheep are said to have the "golden hoof" because the ground is thought to be more fertile after they are pastured on it.

480 Sheep on Argive plains. These old fields would be still less fertile if it were not for the flocks of sheep.

(i) Green Manures — Leguminous Plants

Green crops plowed under help to keep the soil fertile. Leguminous plants such as clover and alfalfa can by means of the bacteria which

grow in the nodules on their roots fix the nitrogen of the air and when plowed under they greatly enrich the soil.

181 Nebraska. When alfalfa land is plowed it is found to grow better crops than before the alfalfa was planted.

(j) Fertilizing — Commercial Fertilizers

In many cases it is necessary to buy commercial forms of plant food if the fertility of the soil is to be maintained. This is especially true of phosphorus as it is sold from the farm in the grains, in milk, and in the bones of animals. Bone meal from the packing houses is used to supply phosphorus for fertilizers, but more of it comes from the so-called phosphate rocks which are found in several of the States.

115 Mining phosphate. Deposits of phosphate rock are found in several places in this country.

(k) Crop Results

Careful observance of the practices which maintain the fertility of the soil make it possible to produce large crops continuously.

357 Wheat. England by careful fertilizing still produces large crops of wheat, although her land has been farmed for centuries.

149. Celery. The right conditions of moisture and plant food make large crops possible.

237 The orange growers of California know that they must irrigate and fertilize to obtain large crops.

47 Melons. In addition to plenty of water and plant food such a melon crop demands warmth and sunlight.

108 Pineapples. Such crops are not produced by accident, but are the results of following the laws of good husbandry.

— For additional scenes on weathering and soil forma
: classification Natural Forms and Forces, also th
y's Special Catalog on Physical Geography and Ge
It is free upon application.

THE PUBLISHERS.

22. FARM CROPS

By W. M. JARDINE, B.S.A., LL.D.

DEAN OF THE DIVISION OF AGRICULTURE AND DIRECTOR OF THE AGRICULTURAL EXPERIMENT STATION, KANSAS STATE AGRICULTURAL COLLEGE, MANHATTAN, KAN.

All children know that animals require food, water, air and warmth but they do not know so generally that plants also must have food, water, air, and warmth. Neither do they understand the importance of plant life. All animal life, including human beings, is dependent upon plant life. The greater part of the food of both mankind and animals is vegetable. The meat that we eat is first derived from plants because the animals from which it is obtained live on plants. Without plants no animal could live; therefore, the culture of plants is the most important phase of agriculture.

Plants get their food from the soil and the air through roots and leaves. The leaves of the plant take food material from the air in the form of gas. The water in the soil absorbs plant food materials. This water is absorbed by the roots of the plant and the food materials are converted into plant tissues to serve, in turn, as food for animals. The plant secures all its water and ash and part of its organic matter from the soil through its roots. The soil then is very necessary to plant growth. All soils are not alike. By referring to the chapter entitled Soils, it will be found that soils differ in mode of formation and in the materials from which they are formed. Soils also differ in fertility and moisture holding power, and consequently in their ability to produce crops.

It is not enough that there be plant food in abundance in the soil. This food must be in a form available for plant use. It is largely the business of the farmer who produces crops to handle the soil in such manner as to provide food in a form readily available for plant use. This may be accomplished by tilling or cultivating the soil and by supplying plant food to the soil.

CROP PRODUCTION

Let us notice the steps in the process of producing and caring for a farm crop.

PREPARATION OF THE SOIL

The first thing necessary is to loosen the soil so that it may become permeated with air and warmth and absorb rain quickly; also that the roots of plants may penetrate it easily. This is generally done by plowing. The soil must not be too loose, however, or it will not retain moisture. It must not be too rough or the seeds cannot be covered evenly. The lumps or clods must be broken finely and the surface made smooth before the seed is planted. A carefully prepared seed-bed will contain moisture and food ready for the plant. It will be sufficiently warm for seeds to germinate and loose enough for the roots of the young plants to penetrate readily.

The following views show different means of preparing land for the planting of crops.

1. Primitive Methods

561 Egypt; 522, China; 488, Russia.

2. Modern Methods

136, 398 The horse is a very important source of native power on the farm.

178 Plowing rich prairie soil with tractor.

179, 332 Clods of earth should be broken finely.

549 Even soil of flooded areas should be prepared.

161 For most crops excessive moisture must be removed.

180 Fertilizing manure spread evenly on the land and plowed under enriches the soil.

159, 165, 358, 364, 173 The best system of farming includes the keeping of live stock on the farm.

166 Rotation of crops is important in maintaining the fertility of the soil. Potatoes leave the soil in excellent condition for other crops, especially small grains. This is the same farm as shown in view 165, originally a potato farm; the dairy was added to maintain fertility.

PLANTING

After the soil has been prepared as in view 179, the seed may be planted. The seed must be covered deep enough to get plenty of moisture to germinate it, but not so deep that air will be excluded. The young plants soon begin to make use of the light and air in preparing a part of their own food.

CULTIVATION

Some crops are planted in rows some distance apart and these crops require cultivation. Cultivation has a threefold purpose, viz., to de-

stroy weeds, to conserve moisture, and to make the plant food in the soil ready for use by the plant. Cultivation may be done by hand or by various types of horse cultivators. Crops planted thickly such as wheat and oats, tend to keep out the weeds; the protection of the ground from sun and wind tends to prevent escape of moisture from the surface, consequently crops so planted do not require cultivation.

In regions where there is little rainfall, dry-farming is practiced. Under this system land is sometimes planted to crops only one season in two years. The season no crop is grown on the land, moisture is conserved by cultivation at frequent intervals. Frequent cultivation keeps the surface soil in a loose condition so that all moisture that falls is absorbed readily and prevents evaporation from the surface. In dry-farming cultivation is done chiefly to conserve moisture.

419 Women cultivating sugar beets by hand.

105 Another method of cultivating crops by hand.

198 Most of the cultivation of farm crops is done by means of the horse cultivator.

184 Corn — the greatest cultivated crop in America.

211, 235 In arid regions special crops are produced which have the power to grow with little rainfall and withstand long periods of drouth.

HARVESTING

After the crop has reached a certain size cultivation ceases and it is left to develop naturally until it is ripe or mature enough to harvest. Methods of harvesting different crops vary greatly as is shown in the following list of farm crops and in the classification on Production and Manufacturing.

THRESHING, STORING, MANUFACTURING

The handling of crops after harvest also varies greatly as will be seen by a study of some of the most important farm crops.

IMPORTANT FARM CROPS

Wheat

Wheat is grown most extensively on the fertile prairie soils of America and Europe. The United States and Russia are the greatest wheat producing countries of the world. The leading wheat producing states of the United States are North Dakota, Kansas, Minnesota, Nebraska, Washington, and South Dakota. Wheat is used chiefly for human food because it is the best grain for making light bread. Wheat is usually grown in large fields and most of the work is done by machinery. In the following views it will be noticed that the men are doing very little work by hand.

178, 179 Show how the land is prepared before the seed is sown.

357 Harvesting wheat with the self-binder. This machine cuts the wheat, makes it into neat bundles, and ties a string around the bundle.

199 The bundles are stood up in shocks, and the shocks stand in the field until the grain is dry enough to stack or thresh.
147 Wheat is hauled in this way to the stack or threshing machine.
177 Threshing wheat. Mountains of straw from which the grain has been removed.
233 In some dry sections wheat can be cut and threshed at one operation. California.
218 Harvesting wheat in Washington — Combined reaper and thresher.
284 Mexico; 479 Greece; 497, 498 Palestine — Primitive methods.

Corn

Corn is the king of cereals. The average annual world's production is over 3.7 billion bushels which exceeds the yield of wheat, rice, or any other cereal. Corn is a native of America. The United States produces an average of over 2.7 billion bushels. This is over fourteen times as much as any other country in the world produces, and forms nearly three-fourths of the world's supply of corn. Other corn producing countries are Roumania, Egypt, Austria-Hungary, Argentine, Mexico, Italy, Russia, and Canada. Over half of the corn crop of the world is produced in the seven states: Illinois, Iowa, Nebraska, Missouri, Indiana, Ohio, and Kansas.

184 A field of corn in Kansas.
136, 160 Modern methods of harvesting corn.
165, 159 Corn put into the silo and fed to stock yields a good profit and the manure from the stock aids in maintaining the fertility of the soil.

Rice

Rice is an important article of food for nearly half of the population of the world. It furnishes the principal food for more people than any other one crop. Rice is grown only in warm sections. India, China, Japan, Siam, Ceylon, Malay Peninsula, East Indies, and the Philippine Islands produce most of the rice of the world. In the United States, rice is grown chiefly in South Carolina, Georgia, Louisiana, Texas, and Arkansas. Rice, unlike any other grain, grows best when the plants are partially covered with water. It is therefore necessary that the land be very level so that the water will stand at an even depth over the field. Rice may be sown like wheat on well prepared land and water turned on the field after the plants get well started to grow. In some countries rice is planted in mud and water, or the plants are grown in small beds and transplanted into the mud just as we set out cabbage or tomato plants. The ground is kept covered with water until the crop begins to ripen when it is drained off and the field allowed to dry before time to harvest the crop.

In some rice growing sections, water is not left on the field continuously. Sometimes there are three applications of water. The "sprout water" is applied as soon as the seed is planted and is left on only a few days. The "stretch water" is applied when the plants have two leaves and is left on about 30 days. When this water is turned off

the field is allowed to dry and the weeds and grass are hoed from among the plants. View 105 shows a field in South Carolina receiving this cultivation. After the plants begin to joint a third and final application of water is made. This is the "loyby flow" and is left on until the plants are mature.

527 Rice fields in Japan. Low level land is best adapted to rice.
549 Filipino farmers preparing land for rice.
528 Rice planters at work, Japan.
104 Irrigation of rice fields from canals.
530 Rice fields under irrigation.
105 Hoeing weeds and grass from among the rice plants before the water is turned on.
529 Harvesting rice just as wheat but in many countries primitive methods are still used.
550 Removing rough hulls from the grain before use as human food.

Oats

Oats are an important farm crop. They are grown extensively in the cooler part of the United States, in Canada and in Europe.

408 Oats growing in Norway within sight of a glacier. (Note method of curing hay in foreground.)
147 Harvesting oats in the corn belt — Illinois.

Sugar

Practically all the sugar of the world is made from two plants, sugar cane and the sugar beet. Each of these produce about one-half the supply. Sugar cane is a tall, coarse-growing plant raised chiefly in British India, Cuba, Java, Hawaiian Islands, Philippine Islands, the United States, and South America. In the United States it is grown chiefly in Louisiana and Texas. Sugar cane is started by laying a continuous line of stalks in a row and covering them. New plants start from the joints and grow to a height of 8 to 15 feet. When mature the plants are cut and the tops and heavy leaves removed. The stalks are hauled to the factory and the juice pressed from them by means of heavy rollers. The juice is purified and heated to drive off the water. It then crystallizes into sugar.

332 Preparing the soil for sugar cane. Tractor drawing harrow and pulverizer, Peru, South America.
333 Replanting cane. Young cane plants will sprout up from the joints of stalks planted in furrows.
258 Cutting the sugar cane.

A hundred years ago the sugar beet contained only 6 to 8 per cent. of sugar. By carefully selecting each year and planting for seed those beets which contained the highest per cent. of sugar, a type of beet has been developed which contains 16 per cent. or more of sugar. The leading countries in the production of sugar beets are Germany, Russia, Austria-Hungary, France, and the United States. The beets are planted in rows and cultivated and hoed as are garden beets. When

ready for harvest they are pulled, the tops removed and the roots hauled to the factory. Here the roots are sliced finely and the sweet juice removed. From this juice sugar is made.

419 Cultivating beets, Sweden. The young plants require careful attention.

198 Cultivating beets, Colo. When the plants become larger a two-horse cultivator is used.

270 Beets stored in sheds with V-shaped bins having canals underneath to carry them to the washing drum.

271 Beet pulp and juice flowing into large iron tanks where the sugar is removed from the pulp by water.

35 Filling and sewing bags of granulated sugar.

34 Conveyor with trays of loaf sugar received from the drying kiln.

185 Cattle are fed on the pulp of the sugar beets from which the sweet juice has been removed.

Tobacco

As a field crop, tobacco was first grown in Virginia in 1612. The world crop amounts to about 2.5 billion pounds of which nearly one billion is produced in the United States. Other countries which produce tobacco are British India, Russia, Austria-Hungary, Japan, and the islands of Cuba and Java.

112 A tobacco field in Kentucky.

297 Harvesting tobacco, Havana Province, Cuba. Tobacco must be cut and the leaves hung up carefully to cure. The quality of tobacco is improved by growing the plants in partial shade, hence the companion crop of banana plants. In Florida it is sometimes grown under sheds with partial roofs; in Connecticut many acres are grown under canvas.

Cotton

Cotton is the greatest of all fiber crops. Most of the clothing of mankind is made from cotton. Cotton is grown only in warm climates. Over three-fourths of all the cotton in the world is produced in the United States south of a line drawn from Norfolk, Virginia, to Memphis, Tennessee, thence west to Oklahoma City, Oklahoma and El Paso, Texas. In the United States cotton is exceeded in value only by corn and hay. Other countries important in the production of cotton are India, Egypt, and China. Much of the labor of raising cotton is done by hand. The crop is planted in rows much like corn. After the plants are three or four weeks old they are thinned to the desired stand. This must be done by hand. The crop is cultivated several times and usually hoed. When mature the cotton is picked by hand and hauled to the gin where the seeds are separated from the lint and the latter put into large bales weighing about 500 pounds each and bound with iron bands.

117 Picking cotton on a Mississippi plantation.

124 Loads of cotton ready for the gin.

119 Bales of cotton at the wharf ready for shipment.

An important fiber crop is hemp which furnishes material for making such articles as ropes, burlap, binding twine, and mats. Sisal hemp comes chiefly from the fiber of henequen, a plant which grows in the Yucatan Peninsula of Mexico, and somewhat in Florida and in Africa. Henequen is very much like our century plant and grows on land that is apparently worthless for other crops.

Hemp

Manila hemp is derived from plantain, a tree-like plant (abaca) of the banana family which grows in the Philippine Islands. Shawls are made from the finer fiber of plantain and ropes from the coarser fiber. Our binder twine and much of our other cordage is made from the henequen or sisal hemp plant.

289 Old henequen plants from which many leaves have been removed for the manufacture of the sisal fiber. Yucatan.

571 Henequen plants, showing the tall flower stalks. Uganda, Africa.

552 Stripping the stems of plantain to obtain Manila hemp fiber.

Forage Crops

Forage crops and live stock are two great essentials to a permanent system of agriculture. Live stock will consume much rough feed and convert it into valuable meat, at the same time producing manure which is of great value in keeping land fertile and productive.

172 Ames, Iowa. Rape makes a desirable hog pasture.

118 Harvesting peanuts, Arkansas. Choice bacon and ham is produced in the south from hogs fed on peanuts.

183 Hogs in alfalfa. Alfalfa is our greatest legume. It is rich in protein — the food which makes young stock grow.

317 Some of the famous beef cattle of Argentina are grown on alfalfa pasture.

181 Harvesting alfalfa. The modern method of handling hay.

388 The old method of handling hay, Germany.

408 Curing hay under difficult conditions, Norway.

127, 186, 301 The natural forage of extensive areas is harvested by great herds of cattle.

480, 190, 173 Sheep are also used to consume the wild plants of plains and mountains as well as the more abundant grasses of our best pastures.

185, 140, 370 Farm crops may be marketed as beef after being fed on the farm.

371, 403, 57 Crops fed to cows and marketed as milk yield a good profit.

211, 235 Spineless cactus, a promising new forage plant for semi-arid regions.

Other Agricultural Products

166 Potatoes grown in the famous potato region of the Red River Valley, Minnesota. Harvesting potatoes by use of potato digging machines.

47 Picking and loading cantaloupes, New York.

118 Peanuts, a valuable food product. The pods are removed from the vines and allowed to dry thoroughly before marketing.
137 Pumpkins as an inter-crop with corn.
149 Celery raised on rich muck land. The bunches after being washed and packed are sent to market ready for us as food.
294 Bananas on cultivated plantation.
285, 287 Maguey plants from which pulque is made.

23. GARDEN, ORCHARD AND WOODLOT

By R. L. WATTS, M.S.

PROFESSOR OF HORTICULTURE, DEAN DEPARTMENT OF AGRICULTURE AND DIRECTOR OF THE EXPERIMENT STATION, STATE AGRICULTURAL COLLEGE, STATE COLLEGE, PA.

I. GARDENING

The home garden as an economic factor cannot be overestimated. Very many families, by intensive cultivation, raise the summer supply of vegetables and part of the winter supply, on a very small plot of land. Since the war began, gardening has become a war measure in the conservation of food. These gardens are giving outdoor work to men who are accustomed to work indoors and are doing a great health work. Market gardening is carried on wherever the produce can reach the cities.

83 The school-gardens are an important part of industrial education and they will occupy a still more important place as the country grows older. They aid materially in the food supply, give the children habits of industry, and cultivate the art of using the hands. Also they cause some to take up farm life and become professional food producers.

47 The cantaloupe or muskmelon is an important trucking crop from the Atlantic Ocean to the Pacific. This truck farm is on the Lake Shore, which is especially adapted to fruit-raising because the large body of water stabilizes the temperature, preventing the early spring budding and the late frost.

137 A field of pumpkins. While the pumpkin is not considered a horticultural crop, it makes such good pies that every horticulturist likes to grow a few for home use. It is also worth noting that pumpkins generally command good prices in the larger local markets.

149 The celery industry in the United States has grown to mammoth proportions. Some years ago the Kalamazoo district was made famous by its extensive fields, but now we find immense areas of this vegetable in various parts of the United States, especially where there are muck soils for its culture. Celery thrives best in deep, moist soils and muck lands seem to provide these ideal conditions.

419 Beets are found in every home garden. Until the plants are large, some handwork is necessary to keep the weeds under control. The frequent and skillful use of wheel hoes, however, will reduce the handwork to a minimum and this is exceedingly important if the beets are to be produced more economically. The beets in 198 are grown under irrigation.

166, 47 The potato is for the most part grown as a field crop, but it is likewise an essential to the garden. The potato prefers a loose, loamy or sandy, well drained soil. There is scarcely any crop that responds so well to the heavy use of fertilizers. The potato is an important food crop in many countries. It thrives best in a cool climate. Dr. Patten, Dean of the Wharton School of Finance and Commerce, University of Pennsylvania, states that the potato was a direct factor in causing the great World War. The introduction of the potato to the sandy soils of Prussia enormously increased the food supply, which in turn was followed by marked increase in population, enabling Prussia to dominate Germany.

210 Irrigation. Most garden crops require abundant moisture. This may often be obtained by thorough cultivation, thus preventing evaporation of the ground moisture. More and more gardens are being irrigated by overhead spraying systems. Naturally in connection with our great irrigation systems supplying all needed water, gardening may be carried on most advantageously. The statement is made that if Germany, at the beginning of the war, had been generally equipped with the most up-to-date irrigation systems as we know them in most parts of America, she would have had no serious difficulty in maintaining an adequate food supply.

423 The city flower markets of foreign countries must be exceedingly interesting. Not only are the flowers beautiful but the people themselves add to the picturesqueness of these markets. It is gratifying to know that flowers are being sold more and more on our own city markets.

II. LANDSCAPE GARDENING

10 The village people of New England give their street trees better attention than do the people of some other States. Note the device around the fine old elm to prevent insects from going up the tree. These fine old trees throughout New England are appreciated and everything possible is done to protect them.

36 Sleepy Hollow Cemetery. This old cemetery is kept in excellent condition. It is an object lesson to those who are careless in taking care of the grounds where their loved ones are sleeping. Trees, shrubs, and hardy perennials should be used instead of tender annual plants, which soon die and disappear.

37 Washington's headquarters at Newburgh on the Hudson. The splendid old trees in the background and vines on the building give this old house a most pleasing appearance. Hundreds of

humble homes might be made just as attractive as this one by the proper use of plants and trees.

90 Part of the city of Washington. The people of Washington are proud of their thousands of fine trees and shrubs. The collection as found along the streets and in the parks represents a great number of different species.

91 The formal type of gardening as shown in this picture is pleasing to a great many people. The fountain in the center of the view is a prominent feature of the landscape.

93 A general view looking over Washington. The student of landscape gardening will be interested in noting the arrangement of trees in the foreground. They are arranged in groups along the avenues, leaving large, broad expanses without any trees.

95 Congressional Library, Washington. The curved walks and drives of this view help to make it highly attractive. The use of curves in landscape gardening is one of the means of making beautiful landscape effects.

169 A bit of water with a canoe and occupants and fine trees in the background always present a most pleasing appearance. Note the wigwam on the right, which is reflected in the water.

241 San Gabriel Mission. This old building would not be half so attractive without the splendid specimens of palms which beautify the foreground.

249 Street in Colon. This would be a very commonplace picture were it not for the tall palms planted near the house. They give the scene a restful appearance which could be secured in no other way.

259 Papaya trees in Hawaii. The people of tropical regions are fond of planting along their walks and streets palms and other tropical plants, just as we like to plant maples and other shade trees along our streets and roadways. They provide more or less shade and make the landscape exceedingly beautiful.

262 In the Acadian land. When we journey to the far North we are attracted by the fine specimens of evergreens. A few well-grown specimens as shown in the foreground of this picture are essential features in many of the northern landscapes.

316 A South American Park, Buenos Aires. This view is not unlike the ones which are common in the best parks in the United States. The broad, sweeping curves and splendid trees are noticeable features in this park.

355 Anne Hathaway's home. The well trimmed hedge and vines on the wall add greatly to the beauty of the scene. The well kept hedges of England are certainly more beautiful than the bare picket fences once so universal in America.

356 Shakespeare's Memorial Theater, Stratford-on-Avon, England. Cattle, sheep, horses and other livestock always add to the beauty as well as the interest of a landscape. The contentment of these cows is thoroughly in accord with the quiet and beauty of the landscape.

360 In England great attention is paid to landscape gardening. These trees trimmed so closely and the wall covered with vines are typical of the country.

361 Lake Grasmere. Those who are interested in landscape gardening will do well to study the composition of this picture. Nothing can be omitted without sacrificing the attractiveness of the view. The massed trees which stand in the foreground, the expanse of water broken by the island in the middle, the village on the other side of the lake, and the mountains in the background, all go to make this an unusual scene. In planting gardens and trees, care should be taken not to cut off beautiful views.

362 The home of Wordsworth. A very humble home made beautiful by the skillful use of trees, shrubs and vines. This is a splendid demonstration of what might be accomplished around thousands of inexpensive dwellings.

376 Blarney Castle, Ireland. This old castle would have little to make it attractive were it not for the hedge and trees in the foreground.

377 The Lakes of Killarney. After all, Dame Nature cannot be excelled as a landscape gardener!

386 Hamburg. The water front is beautified by the planting of trees wherever that is possible.

422 Avenue des Champs Elysees, Paris. The French people love trees and they are careful to give their street plantings the very best attention.

534 In the Land of Flowers. The Japanese are great lovers of flowers and particularly of the cherry blossoms. The "Feast of the Cherry Blossoms" is an annual celebration and all the people go where they can see and admire the beautiful flowers of this tree.

535 A Japanese garden is extremely interesting to a landscape gardener. They are especially skillful in dwarfing trees. The garden is more like a picture, a beautiful miniature, than it is like a real garden.

586 A view in Melbourne, Australia. This is an exceedingly attractive bit of scenery in the city of Melbourne. The small lake or pond is a striking feature, and there is abundant evidence that the trees and shrubs receive the very best care. In the foreground is another example of extreme formality in the arrangement of flowering plants.

III. ORCHARDING

85 Peach harvest. New Jersey, Delaware, the Lake shore and warmer parts of the country produce immense quantities of peaches. These may be yellow or white with the pulp free from or clinging to the stone. Peach trees are very tender. They must be sprayed and pruned and carefully cultivated. They are short-lived trees.

108 Harvesting pineapples. This picture gives you some idea of the extent of the pineapple industry in Florida. Pineapples are grown on a very large scale and shipped. They are largely used for canning and preserving. The industry is profitable when properly managed.

44 In order to produce good fruit, trees must be sprayed. A strong spray is used when the trees are bare and weaker ones when in leaf. The trunks must be kept smooth and clean.

175 Harvesting apples. Scenes of this character are now common in all apple-producing districts of the United States. A large proportion of the apple crop is placed in barrels, though many of the better specimens are packed in boxes.

234 An immense quantity of almonds, as well as other nuts, are grown in California for market. The student should note how thoroughly this orchard has been cultivated. This is one of the main reasons why the California horticulturists grow such fine nuts as well as fruit. They give their trees as well as their land the very best treatment.

236 California vineyards. These grapes are the result of intensive culture. The California vineyards have become famous for their large crops of grapes. Some of the bunches are mammoth in size, as shown in the picture before us.

319 Vineyard in South America. This view shows the work which must be done in a successful vineyard. The vines must be cut back and the ground carefully cultivated. There must also be supports to keep the vines up with room to grow.

390 Some very fine vineyards may be found on the hills of Germany. These people have found it necessary to make all of their tillable land yield maximum returns. Note the thrifty growth of the vines.

237 A California orange grove of 10,000 acres. After seeing these immense orange groves of California, one wonders what is done with all of the fruit. The most intensive systems of culture and management are used in these groves and all possible care is exercised in picking and forwarding the fruit to market.

238 Orange blossoms and fruit. To those of us who are accustomed to seeing such fruit trees as apples, pear, peach and cherry, it seems strange to see both fruit and flowers on the tree at the same time. The large green foliage and the beautiful blossoms and fruits of the orange make the trees exceedingly attractive.

437 Picking Valencia oranges. It is not a difficult matter to pick oranges from these low, well trained trees. Our American boys would not like to carry such a large load on top of their heads.

293 Mango trees laden with fruit. The mango is just as important to many people living in tropical countries as the apple is to people in temperate regions. The trees are evergreen with very dense foliage and some of them are very large. It is an important fruit crop in southern Asia, India, Brazil and other tropical countries.

294 Harvesting bananas. This is exceedingly interesting to boys and girls as well as grown folks who are fond of bananas. They are practically green when harvested and shipped to northern storage houses for ripening. It is surprising how cheaply this fruit can be sold in our northern markets after being transported so far.

530 The tea farms are usually small and require careful cultivation and much attention, for the plant will thrive only in well manured or very rich soil. Although an evergreen, the leaves are useful only at a certain season. This Japanese maiden seems to be very happy as she starts out for a basket of tea leaves. The Japanese love plants and outdoor life, and all of us in America will do well to copy after them in this respect.

551 Husking coconuts. This beautiful scene of large piles of coconuts under the trees from which they have been harvested, gives us some idea of the quantities of coconuts which are used.

IV. THE WOOD LOT

1 Logging in Aroostook Co., Maine. Scenes like this are common in Maine and other states where the land is heavily forested. The land had to be cleared and some farmers, lacking foresight, cleared all their land as soon as they could.

72 Daisy field backed by woods. Woodland conserves rainfall. The rain cannot run off and the trees prevent rapid evaporation. The wood lot, then, is important in conserving moisture since the united woods of a neighborhood may cover an appreciable area.

74 On bare hills the rain runs off rapidly, swelling the stream at the base. This results in sudden floods very destructive to farming interests.

445 The farmer with a wood lot has a constant supply of wood for fuel.

73 Pennsylvania; 445 Switzerland. The farmer with a wood lot has a supply of wood for posts, building material and all the uses so numerous on a farm.

38 Hudson Valley. Notice how the hills are wooded. That prevents quick drainage of rainfall. The low land is partly wooded. The force of wind in the district is broken. Each farmer has a constant source of revenue, as the trees suitable for cutting are taken out year by year and the others are allowed to grow.

70, 71 Chestnut, elm, maples and other hard woods are increasing in value each year.

107 Turpentine farm. In the South a piece of such timber would yield turpentine, rosin and tar, besides a supply of pine timber valued in building.

130 Tapping a maple tree. This work is attended to at the approach of warmer spring weather. There is something especially invigorating and uplifting in working among the trees at this

season of the year. Farmers who do not have a maple sugar grove might add to their incomes as well as to the pleasure of their homes by planting a large number of sugar maples along the roadside or perhaps on rough land which is not suitable for agricultural purposes. A maple grove is also a source of timber and fuel supply.

162 A huge sled-load of logs. It is surprising how many logs a team can haul if there is snow on the ground.

184 On our prairies and plains timber was very scarce and was accordingly valued the more highly. Such a wood as is shown in the background will be carefully conserved.

70, 72, 184 Some states, to encourage the care of woodland, give a rebate on the taxes of such land.

224 A very large tree of the Northwest. Trees of such mammoth size are common in California and throughout the Northwest. It may interest our readers to know, however, that some very large trees may be found in the eastern part of the United States. For example, some years ago the writer measured a chestnut tree in Montgomery County, Md., which was 12 feet in diameter. In 1888 a white pine tree was grown near Lumber City, Pa., that measured 100 feet in length after the limbs were removed and the spar was ready for market. Sixteen horses were required to draw it to the river. The butt of the tree was about 5 feet in diameter.

Note: — The Keystone View Company's General Catalog containing a list of thousands of stereographs and lantern slides will be sent free of cost upon application. It contains an extensive list of industrial subjects also a complete series of Travel Tours of the leading countries of the world.

THE PUBLISHERS.

24. ANIMAL HUSBANDRY

By W. A. COCHEL

PROFESSOR OF ANIMAL HUSBANDRY, KANSAS STATE AGRICULTURAL COLLEGE, MANHATTAN, KAN.

History shows that no permanent and profitable system of agriculture has been developed without livestock as a dominant factor, except on comparatively small farms, when special crops are produced. The most powerful nations of the world are those which are noted for their extensive development of livestock. More than one half of all the expenditures for food in the United States are for animal products. The problems of maintaining soil fertility and increasing acre yields of crops are most easily solved when the by-products from feeding livestock are available. The usefulness and value of animals of all kinds on the farms is an item to which too much attention can scarcely be given.

DAIRY CATTLE

57 New Jersey; 159 Wisconsin; 165 Minnesota; 403 Holland. Holstein cattle are distinguished by their color, which is always black and white, for their very heavy milk production, high total yield of butter, and low percentage of butter fat. These cattle are the largest of all the dairy breeds.

364 Jersey cattle come from the Isle of Jersey in the English Channel. The predominative color is fawn varying from a golden yellow to black with brown marking. They are frequently found with white markings on any part of the body. They are noted for the extreme richness in butter fat of the milk they produce and are the most popular of all breeds as family cows and near cities where milk with a high percentage of butter fat is called for.

371 The Ayrshire is a typical breed of dairy cattle, originated in Scotland. They do not produce as much milk as the Holstein, nor is it as rich as that of the Jersey. Their milk comes more nearly meeting the requirements of the best city's trade, without modification than that from any other breed of dairy cattle. The Ayrshire is smoother and more thickly muscled than the other breeds of dairy cattle, hence are not discriminated against too much, by buyers of beef cattle on the markets. They are

better grazers and thrive on poorer pastures than the other breeds of dairy cattle.

356 Dairy Shorthorn cattle, England. While the Shorthorn is mostly a beef breed, in England considerable attention has been given to the development of the Shorthorn as dairy cattle. Perhaps three-fourths of the milk delivered to the City of London comes from this breed of cattle. Usually stock raisers wish cattle highly efficient either for beef or milk production. Many farmers, however, wish cattle that will give a fair milk supply as well as being satisfactory for beef. The dairy Shorthorns meet this requirement. Such cattle are known as dual-purpose cattle.

339 The dairy cow indicated in this view does not represent any of the breeds of special dairy cattle but belongs to the ordinary common stock of the country. She has the typically long, narrow head, sharp withers and depth of body and wedge shape which indicates that her performance at the pail would be creditable.

BEEF CATTLE

317 The predominate breed of cattle in Argentina is the Shorthorn. They are very popular in America and Great Britain. Red, white and roan are the typical Shorthorn colors. These cattle are the largest of any of the beef breeds, mature early and dress out a high percentage of beef to live weight. When finished the carcass yields a high proportion of high priced meat such as rib and loin, in which the fat and lean portions are so distributed as to present a beautifully marbled cut of beef.

358 Hereford cattle originated in Herfordshire, England. The typical color is red with white face, a little white on crest and feet. They are noted as the best grazers of any of the breeds of beef cattle; they mature at an extremely early age, are hardy and able to withstand extremely adverse conditions. This has made them the most popular of all breeds for range purposes. They are especially heavy in their fore ribs and heart girth, also in their loins.

370 Aberdeen-Angus cattle originated in Scotland. They are black and hornless, of the extreme beef type, short legged, blocky, thickly and evenly fleshed, mature at a very early age and produce when slaughtered, a smooth even carcass of well marbled beef. Aberdeen-Angus steers have won more championships for fat cattle at the leading American shows than those of any other beef breed. They dress out an unusually high percentage of beef to live weight.

127 Texas range cattle have been bred up from a Spanish or native foundation by the use of Hereford and Shorthorn bulls, the result of the attention to breeding has made the range cattle better for the production of beef and more desirable in the feed lots

than those that are produced in the older farming sections of the country.

185 The steers feeding in this view are typical range cattle from the herds from Texas, branded so as to distinguish them from other cattle when they become mixed. These cattle were taken out of the pasture on the 15th of August and put on full feed of corn and cotton-seed meal, bran and oats, the purpose being to put a sufficient amount of flesh on them to have them classify on the market as choice beef. They were fed ninety days.

186 Cattle shown in the round-up are of a mixed breeding and typical of the cattle that are found in the short grass country. The improvement being made by the use of pure bred beef bulls in herds of this sort is remarkable.

140 Stock yards, Chicago. These cattle are similar to those in 186 except that they have been fattened for market, probably on the farms in the corn belt.

589 The range cattle of Australia are similar in type to those described in views 127 and 317.

301 The cattle of Jamaica are typical of the old-fashioned long horned steers of the early days of Texas. The same kind of cattle are being produced in Mexico. They are cattle very deep in the heart girth, narrow through the crops and loins, with comparatively little muscular development in the hind quarters. They are noted for their constitution and rustling abilities.

545, Java; 548 Philippines. The cattle of Southern Asia do not represent any of the breeds which are of importance in America. They are from the same source as the sacred cattle of India, which are used for draft purposes rather than for meat.

DRAFT HORSES

138 Percheron horses originated in France, their popularity is due to the fact that the French government has encouraged their breeding. They are the most widely distributed of all the breeds of draft horses in America. They are noted for size, quality, and disposition. The predominating colors are grey and black.

166 The potato sections of the United States demand the heaviest type and highest priced draft horses that are produced, because of the heavy machinery which they must handle and the weight of the loads which they must take to market.

398 Belgian horses are of the extreme draft type, short legged, deep bodied, and heavily muscled. They are kept fat very easily, which makes them quite attractive. The predominant colors are sorrel, roan and bay. They are second in importance among the draft breeds in America.

320 The cart horse must have weight and substance in order for it to handle heavy loads without material effort. They usually possess some blood of the draft breeds. The picture indicates a

pounds each. They were symmetrical, carried their
and tails well and were noted for their beauty of styl
action.

orses used on stage coaches are usually very rugged, of
which is remarkable for endurance, quickness of actio
sure footedness. They must be free from all unsoundne
extremely well broken.

CAVALRY HORSES

avalry horses are lighter, quicker, and more compact th
draft breeds. The best type is from thoroughbred stoc
has intelligence, speed and endurance. The Government i
tering the development of the cavalry horse industry, but i
farming sections, the heavy draft type is more profitable.

PONIES

he cow ponies are horses of remarkable intelligence and
ance. They must be very quick, active and are very sure
in order not only to perform the service required of the
not to endanger the lives of their riders. They are usually
fifteen hands high and weigh from 850 to 1,100 pounds.

he ponies used by the Indians are usually from thirtee
one-half to fifteen hands high, will weigh from 750 to
pounds, are very tough and have a remarkable endurance
dians usually prefer the horses of broken colors, with
siderable amount of white, which makes them more att
to them.

MULES AND DONKEYS

otton mules are very compact, and from fourteen and o
to fifteen hands high, they are quick and active.

SHEEP

173 Shropshire, Oxford and Cotswold sheep. The sheep in this view are of the mutton type as distinguished from the wool type and represent the breeds that are most generally used in the farming districts of the United States; they are short of leg, deep of body and wide of back.

190 Merino sheep on range. Range sheep are the most hardy and free from disease of all the sheep produced. They are the source of practically all the lambs which are marketed from the first of October to the first of May.

GOATS

411 Norway, 447 Switzerland. In Europe more than in America the goat is an important feature of animal husbandry. There the milking goats are preferred and this variety is rather abundant. In America the milking goat is practically unknown, except among the European population in our industrial centers. With us the goat is raised for its hair, known commercially as mohair, and for its meat, which forms a considerable item in some markets. Texas raises more goats than any other State.

HOGS

172 The hogs used for pasturing rape in the corn belt of the United States are usually of the extreme lard or fat type, as distinguished from the bacon type of hogs.

183 Poland-China hogs originated in the United States, are representative of the fat or lard type, and noted for their early maturity, thickness of flesh, good disposition and their popularity throughout the corn belt.

CHICKENS

56 White Leghorn hens in laying house. Poultry keeping is one of the most important phases of animal husbandry. The farm flocks of the country produce eggs and meat that equal in value some of our most important grain crops. Near the city markets the raising of chickens is a specialized industry. No other form of animal husbandry appeals so strongly to the back-to-the-lander as chicken raising. No farm business is so widely engaged in by amateurs and none reports so large a number of failures. It is exacting work, requiring great regularity of effort and close attention to details. Because of their patient care in looking after the detailed work, women are even more successful than men in the handling of poultry.

DUCKS AND GEESE

216 Puget Sound, Wash.; 401 Holland. Ducks and geese form an important item in poultry production. They are raised mostly

for the meat supply, but have considerable value also for eggs and feathers. They are water fowls and, if they have access to a stream or pond, will forage for a considerable part of their food supply. They are not so extensively raised as chickens although there are many large duck farms.

PIGEONS

240 Pigeon farm, California. Pigeon farming for the raising of "squabs" is an attractive phase of poultry raising although not so widely engaged in as some other forms of poultry farming. Only those specially qualified and with good experience should engage extensively in this line. Raising the "squabs," preparing them attractively for market and selling on a satisfactory basis require considerable skill and business ability.

25. FARM MANAGEMENT — FARM MACHINERY

By MARTIN LUTHER FISHER, M.S.
PROFESSOR OF CROP PRODUCTION AND FARM MANAGEMENT AND IN CHARGE DEPARTMENT OF AGRONOMY, PURDUE UNIVERSITY, LAFAYETTE, IND.

Assisted by WM. AITKENHEAD, A.M., M.E.
ASSOCIATE PROFESSOR OF FARM MECHANICS, PURDUE UNIVERSITY, LAFAYETTE, IND.

I. FARM MANAGEMENT

Farm management deals with the handling of the farm and its equipment so as to produce farm products with the greatest profit and still maintain, or even increase, the productiveness of the soil.

Management is different from production. One may grow a big crop (production) but he may not dispose of it to the best advantage (management). One must decide what breeds of live stock he will keep and how many his farm will furnish feed for (management), but he must breed, feed, and care for them properly also (production).

It is not sufficient that the crops grown and the live stock kept are profitable — they should be the most profitable of their kind. Producing milk and butter may be profitable, but keeping beef cattle and selling fattened animals may yield a larger profit. Corn, oats, and clover is a good rotation and may be profitable, but corn, wheat, and clover may yield a larger profit.

Every good manager will study the conditions surrounding him in order that he may engage in the type of farming best adapted to the soil, climate, labor supply, and markets. If the soil and climate are favorable and the markets accessible, grain farming may pay better than grazing live stock.

In the disposition of the crops it may pay better to sell them than to feed them even though the manure be returned to land. If the prices of corn and hogs are too near alike, one had better sell the corn rather than feed it and thereby have the risk of loss by disease as well as the loss of labor and the grain fed. In the studies made of a great many farms it has

been found that neither the *selling* of *all* the crops nor the *feeding* of *all* of them gave the larger profits, but that where about 40% of the farm income came from the selling of the crop and the rest from the sale of live stock and live stock products the best results were obtained. It seems that it pays best to have some crop, or crops, to sell for cash.

A great many people believe that the small farm is more profitable than the large one, but it has been shown many times that where the same type of farming is used on both farms the larger one is usually the better paying. A large income cannot be made from a small business. A large area furnishes the possibilities for big crops and a large number of market animals.

The proper adjustment of equipment is important. The machinery, the teams, and the labor should be adapted to the size of the farm and the nature of the farming. A tractor is not profitable on a 40 acre farm but is quite likely to be so on a 200 acre area. Four-horse teams cannot be used to very good advantage on the small, but are decidedly useful on the large farms. Grain farming does not require much hand labor but truck farming and gardening require hand work almost exclusively.

A large labor income is what the good manager strives for. The labor income is found by subtracting all expenses of operation from the gross income obtained by the sales of crops and live stock, and from this remainder take the interest on the investment, say at five per cent. In counting up expenses the cost of the family living is not included. Also, in determining the labor cost, the labor done by members of the family and not paid for in dollars and cents should be calculated at a reasonable rate and added to the expenses. The labor income represents the farmer's salary. Beside this he has had the use of a house, garden and truck crops, butter, milk, eggs, and fruit — all of which has been found to amount to about ninety-five dollars per each adult member of the family.

A. CHOOSING THE FARM

In order to make a success at farming the farmer must give attention to the farm he selects. The farm ought to be well located for convenience to roads, markets, and neighbors. The soil and climate must be adapted to the kind of farming which the farmer intends to follow.

1. CONTOUR

(a) Tilled Crops

Perhaps the first thing to give attention to in selecting the farm is its contour.

522, 488 Level or gently rolling land is easily plowed even by primitive equipment.

178, 179, 332 On level land tractors can be used and thus save horse labor.

180 This land is rolling, but not too much so to use the tractor effectively.

198 Level fields make easy cultivation and the loose soil will not wash away in heavy rains.

166 Level land is desirable for potatoes, sugar beets (198), corn (137) and all crops that need cultivation during the summer.

149 Celery is always grown on level land, usually peat soils found in regions of old lake beds.

333 Crops like sugar cane and rice (104, 527, 528) which need irrigation must be grown on level land.

147, 199, 357 Level fields make easy harvesting, and usually produce the largest crops.

218, 233 The large level fields of the West permit large machinery to be used. This cuts down the cost of production.

408 A mountainous country may have many rich valleys, but the fields will be mere patches and labor saving machinery cannot be used advantageously.

(b) Grazing

38 This is beautiful scenery, but the land is almost too rough for tillage. It would be better for pasturing cattle or for growing orchards.

388 This land is too hilly for any but hand work. Unless labor is plentiful and cheap the cost of production runs high. It would be excellent pasture land, especially for sheep.

301, 317, 589 In sections where grain and cultivated crops are not grown extensively level lands are also used for grazing.

480 This level plain would probably return a larger profit if it were farmed in cultivated and grain crops.

183 If the farmer wants to graze pigs he will select level land so that the crop grazed can be one in the regular rotation.

(c) Fruit Growing

44 While orchards are usually planted on rolling or hilly lands, level land is also well suited and is desirable when large sprayers are to be used. Rolling land is better for fruits than level land on account of the drainage offered for both air and rainfall. The air drainage prevents damage from frosts.

390 Grape production is nearly always on hillsides, although level land is also used (319).

108 Pineapples need irrigation, hence level land must be selected.

prairie soils often have to be drained to make ... productive.
ı lands are excellent for crops but must be drained.

(b) Irrigation

n is the opposite of drainage. Lands must be quite level ːcessful irrigating.
field shows how level the fields are in Japan.

(c) Location

fe is isolated at its best and in selecting a farm one give attention to location as regards roads, neighbors, ıarkets. This farm seems to be far from any human tion.
ːm seems to be located near a traveled highway as there veral houses in the distance.
mountainous country there is little outlet to market.
ırness of the house adds homelikeness to this farm.
lroad suggests opportunity for marketing the products of .rm. The hauling of crops long distances to the shipping is expensive.
ʏn in the distance suggests a marketing place as well as ıping point. Unless the grower can ship and market his cts easily and cheaply he is not encouraged to do his best.

(d) The Soil

epends on the soil for successful crop production. Notice ılack and mellow this soil is.
: how nicely it works up when disked and harrowed. A seed bed can be prepared without much labor in such soil.
ta soils and the alluvial soils in river bottoms are the most ctive and everlasting that can be found.
... soils are usually well adapted to producing grain

(e) The Climate

408, 413 After all the climate determines what crops can be grown. In this region of snow and ice one cannot expect to grow any delicate crops.

136, 137, 147, 184 These are common scenes in the corn belt where conditions are most favorable for the production of the cereal crop.

199 Wheat can be raised in regions of scanty rainfall.

44, 175, 85, 390 The temperate zone is also the region of large fruit productions.

108 Pineapples, 294 Bananas, and 238 Oranges — grow in the subtropical or warm part of the temperate zone.

258 Sugar cane grows best under tropical conditions.

B. TYPE OF FARMING

When a farmer gets most of his income from the grain which he grows and sells, he is said to be engaged in grain farming; when his income is mostly from fruits, he is engaged in fruit farming; and when his income is from several sources like grain, live stock, fruits, etc., no one of which yields over 40 per cent. of the income, he is said to be engaged in mixed farming, and so on, the type of farming being named according to the source of income.

1. MIXED OR GENERAL FARMING

In this type of farming, the farmer raises some of the grains, like corn, wheat, oats, rye, or barley; some of the kinds of live stock like horses, cattle, sheep, and hogs; produces hay; has fruits; sells milk, butter and eggs, grains, and live stock. He has an income from several sources. General farming is the most common type because it is the safest. All of the farmer's hope of an income is not based upon one source, but if one thing fails, it is likely that some other crop will succeed. General farming requires a rather large investment. A good deal of land is necessary to run so many different enterprises and it takes a good many kinds of machinery, buildings, and other equipment to carry on the different lines of work.

136, 137, 160 On the general farm the corn is usually cut and put in shock or in the silo. It is useful for winter feed. The corn-binder is a labor saving machine found in nearly all corn belt farms.

172, 183 On the general farm in the corn belt many hogs are kept. These are usually pastured during the summer, because this is an economical way of producing growth. Rape is used quite extensively for such a pasture. Alfalfa is an ideal pasture for pigs. It produces rapid growth and economical gains.

185 Feeding carload lots of steers is also common in the corn belt.

181 This is another example of large machinery on the general farm. The general farmer usually makes a good deal of hay to feed his stock in the winter season.

2. LIVE STOCK FARMING

Live stock farming requires large areas of land because pasture is needed. Of course, cattle and horses require more pasture land than pigs and sheep.

127 The large cattle herds are in the West and on rather cheap land.

186 On the ranges it usually takes four to ten acres of land to furnish pasturage enough for an animal; in the eastern part of the United States about two acres are enough.

301 Large ranches of cattle are also found in the tropics.

317 Argentina has vast areas of land good for growing alfalfa and other pasturage. These cattle come into competition with cattle in the United States to some extent.

3. PRODUCTION OF BREEDING STOCK

On many farms the main source of income is from the sale of animals for breeding stock, that is, the sale of well-bred animals to start new herds and flocks. The fine stock business requires a big investment in animals, buildings, and care. They must be well housed, and carefully cared for by experienced men. If they can be sold for a good price the farmer will make money, but as work animals, producers of butter, milk, or wool, or whatever product is peculiar to the class of animals, they are little better than high grade animals and these are not nearly so expensive to own and to care for.

For various breeds of farm animals and comment regarding same see classification on Animal Husbandry.

4. GRAIN FARMING

In grain farming large areas of land are used and usually the same grain is grown year after year on the same land. This is contrary to good practice in rotation of crops. In some sections the crop is corn year after year. On river bottoms which are frequently renewed by the deposits from overflows this continuous cropping does not seem to do harm, but on lands not so renewed the practice soon shows decreased yields.

218, 233 The best examples of grain farming on a large scale is seen in the large fields of the West and Northwest.

179, 199 On these large grain farms of the West it may be that no live stock at all is kept since all the work can be done by machinery. Farming without live stock is disastrous unless great care is taken in returning the straw and stubble and supplementing this with mineral fertilizers, like phosphorus and potassium.

177 Here we see large stacks of straw from the threshers. In nearly every case this straw is burned instead of scattering it back over the land. Such farming is wasteful of the soil's fertility and is called *exploitive.*

5. FRUIT FARMING

Fruit growing is a form of specialized farming and is done in a more careful (intensive) way than grain and mixed farming. Fruit farming requires special knowledge of the fruits that are grown. It also requires special apparatus for spraying, harvesting, and packing.

44 The fruit grower has to fight insects and diseases. This is done by spraying.

175 To get good returns from the market the fruit must be graded and carefully packed. Honest packing helps to sell the crop.

85 Most fruit growers give all their time to one or two kinds of fruit. There is a lot of work to do in spraying, pruning, thinning fruit, harvesting, packing, and marketing.

237 Oranges are grown on a very large scale in California and Florida. Orange growing requires very special knowledge.

236 This grower gives all his time to his grapes.

390 This shows the extent of some of the vineyards and gives an idea of the labor necessary for maintenance.

6. DAIRYING

Dairying as a business requires special knowledge of how to feed for milk production and how to care for the milk in the way to make the best product. A rather large investment is required in cows, barns, and land for grazing purposes. In America it rarely pays to keep cows up all the time. Labor is too scarce and high-priced, and our land is cheap as compared with European dairy sections. Also, we cannot get high enough prices for the butter or milk to pay for keeping animals on the *soiling* system.

159 This shows the large barns and valuable cows kept on this dairy farm. It is one of the most famous dairy farms in the United States.

165 This shows a more expensive equipment. Notice the large silos. Silage is one of the most important feeds for dairy cows. An expensive equipment means that the profits are cut down by a big interest on the investment.

57 It is a part of good management in a dairy to keep everything clean and sanitary.

7. POULTRY

Poultry does not require a very large investment to get large returns. Knowledge of how to care for hens so as to make them lay is necessary.

56 There are many breeds of poultry. Most people keep poultry mostly for the eggs which they lay. The White Leghorn is one of the best laying breeds.

8. SPECIAL CROPS

The risk of failure in special crops is greater than where general farming is carried on. If the season is unfavorable, the crop may

fail partly or entirely. If it is favorable, there may be so large a supply that the market is flooded and a very small price is obtained. When general, or diversified, farming is practiced it is likely that one or more crops will bring a good price, or make a good yield even if some do fail. Special crops always furnish a labor problem, either a large amount is required, or else it must be highly skilled. Also, the special crop usually does not furnish regular and steady employment.

117 Cotton is the sole source of income for many farmers. It requires much hand labor at harvesting time.

198 The sugar beet requires much hand labor for thinning and harvesting. The beet crop is a very profitable one. The farmer is always assured a market for this crop, because it is contracted for before it is planted.

47 The cantaloupe is in great demand in all cities and growers make good returns from their fields.

149 Celery belongs to the group of truck crops. It requires a special soil like peat.

108 The pineapple also requires a special soil as well as special knowledge of the crop. This field is fixed for irrigation, thus removing any danger or loss by drouth.

112 Tobacco is widely grown in some states. It requires almost constant attention to keep the tobacco worms (large caterpillars) from injuring the leaves. Special care is required in harvesting and curing. Large curing sheds are needed.

C. MARKETING FARM PRODUCTS

It is not enough that the farmer manage his farming operations skillfully. He must also market his products to the best advantage. Profits from farming quite largely depend upon selling at the right time. Successful selling depends a great deal upon the quality of the article and the way it is presented for sale. Staple articles like the grains, hay, and live stock are so widely used and so constantly in demand that one can always be sure of a market. There is never a time when these articles cannot be sold for a fair price. Such articles as fruits and vegetables, and sometimes butter and eggs, are frequently so abundant that they bring a very low price in the market — often so low that the grower is discouraged and ceases to produce them.

Such products as hay, grains, and live stock do not receive much picking over and arranging before being marketed, but fruits, vegetables, and eggs need to be carefully assorted and put in convenient containers before being offered for sale. Clean, fresh articles, uniform in quality and size, displayed in attractive containers will always sell better than articles not so arranged.

The staple articles are usually sold in large quantities, but the less staple ones are sold in small lots. Wheat, corn, and hay, etc., are sold in carload lots; live stock are sold by the head or pounds weight, but potatoes, apples, oranges, rhubarb, berries, etc., are usually sold

by the small lots. In the larger cities there are usually market places for displaying the products and making sales. Sometimes it is in the open along the curbstone; other times it is in a covered place.

7 Many of the large cities have market houses.

423 This is a curbstone market for flowers.

395 A market where vegetables are sold. Selling in the market usually nets the producer the largest possible return for his product.

140 These animals have been shipped from the farms and will be sold to butchers. They are fine animals and will bring the highest price paid.

124 The cotton farmer markets his crop as seed cotton, that is, the seed is still attached to the fiber. Many farmers lose a great deal because they do not take the seed back to their farms and use it as a fertilizer.

339 This way of marketing milk may insure a fresh article, but it is wasteful of time, and time is money.

396, 487 These methods are economical in that they use cheap labor and a small amount of equipment.

D. QUALITY OF THE PRODUCT

The quality of the product produced has much to do with the farmer's profits. A large yield per acre of crops is a measure of his success, provided it has been produced without excess labor and expense. Well bred animals are able to return larger profits for their feed and care than scrub animals. The grade of product put on the market is an indication of the farmer's ability.

160 The large ears indicate 60 or 70 bushels of corn to the acre, while the average yield is near 30 bushels. It took no more labor to grow the 60 bushels than to grow 30 bushels.

199 Here is a 30 bushel yield of wheat, while the average yield is about 14 bushels. Other things being equal, the man with the large yield makes the money.

181 An alfalfa yield will give three or more crops in a season, while clover will not give more than two and timothy only one.

423 These flowers are the results of the florist's best efforts and will sell well.

236 The fine large clusters shown here indicate a heavy yield and that will give the grower a good income for his labor.

175 In any crop, and especially fruits, there is a considerable quantity of poor specimens. These should be graded out.

112 This excellent crop will probably bring its grower more than a hundred dollars an acre.

149 Notice how good a strand of plants are shown here. Truck growing is intensive and expensive work and the farmer must have a good stand of plants.

47 These cantaloupes will sell for a good price.

198 This crop of sugar beets ought to bring its owner a hundred dol-

lars an acre. Twenty-five or thirty dollars will cover his expense for production.

117 See how thick the cotton balls are on the stalks. This field will make a bale to the acre. The average crop is a quarter of a bale.

56 The kind of live stock one keeps and the way he keeps them shows something of a man's efficiency as a manager. Here is a lot of one of the best breeds of poultry and they are well and comfortably housed.

57, 159, 165 These fine barns and well bred cows suggest successful dairy farming.

358, 364, 370, 398 The very appearance of these animals tells of their good breeding.

172, 183 Note the sleek, thrifty appearance of these pigs.

185 It pays to feed crops to such animals as these.

173 These are the kind of sheep that pay. They will produce good fleeces of wool and furnish a good lot of mutton of high quality besides.

E. LABOR

Labor is of two kinds: man labor and horse labor. The efficiency of labor is greatly affected by climate, skill of worker, and the use of machinery. In the extremes of climate workers cannot do their best. In cold regions the worker is not comfortable and the amount of clothing worn hinders his movements; in hot regions the worker must go slowly or be overcome by the heat. Workers who have been trained to do any kind of work become skillful in performing it and thus quite efficient. Some workers know no trade and are not inclined to learn. Their labor is usually expensive because of their waste of time and materials in not knowing how to labor effectively. The use of improved machinery adds greatly to the amount of work which one man can do. In many cases one man does the work which formerly took several men to perform. A man with four horses to a gang plow, or driving a tractor, accomplishes just as much as two or more men used to do with less improved machinery. See Tools, Implements, and Farm Machinery.

(a) Labor and Equipment

357 A man with a self-binder can harvest as much wheat in a day as ten men used to cut with the cradle.

136, 160 One man with the corn binder and two other men to put up shocks can handle as many acres in a day as five or six men working with corn knives and do it more easily.

181 The scarcity of man laborers on farms has compelled farmers to buy improved machinery. The hay loader saves the labor of at least two men.

284, 479, 497, 562 The primitive method of threshing shown here cannot be so complete as that shown in 177. Too much grain remains in the straw and is lost. But the cost of production is

often less than that under modern methods, because of inexpensive equipment and low cost of labor.

177 The work here is completely done but at a high cost of production. The machinery is expensive and the labor high-priced. A larger yield per acre must be obtained to offset these costs.

138 A farm hand will take pride in doing his work when provided with a good team and equipment like the one shown here. Such a team is able to do a good day's work, too.

561 One would not expect much pride to be taken in an outfit like this, nor expect to do much work in a day.

549 The water buffalo is a homely animal, but he is the most efficient work animal for the rice farmer.

178, 179, 180, 332 On large farms much horse labor has been done away with by using the tractor. One man driving a tractor does as much work as three or four men and as many three-horse teams.

(b) Labor and Live Stock

127, 186, 301, 589 The grazing of cattle can be managed with very little labor. The labor cost per head is thus very small.

190, 480 The life of the shepherd is very lonesome and monotonous, but not at all laborious. With the help of a good dog one man cares for hundreds of sheep.

183 Grazing hogs on alfalfa, or clover, is a cheap way of making pork. It requires little labor.

(c) Labor and Field Crops

528 Rice probably takes more hand labor than any other crop.

105 Where a large number of workers are employed it is necessary to have an overseer or manager to direct the work.

419 Sugar beets require hand labor for weeding and thinning. This makes the beet a costly crop to produce.

112, 297 Tobacco requires much hand labor.

166 Potatoes require extra labor for picking up at harvesting time.

117 Negro help is used almost entirely for cotton picking.

118 Peanuts have to be hand picked and sorted.

258 Sugar cane is handled mostly by man labor. The cultivation is performed by horse labor.

47, 149 Truck growing requires mostly hand labor. Large areas cannot be handled by one man.

147 Wheat is a good example of an extensive crop, that is, one that does not require much labor per acre farmed. The same is true of the hay crops like timothy and clover or alfalfa (181).

(d) Labor and Fruit Crops

44, 175, 236, 390 Fruit crops require a somewhat higher intelligence and skill than ordinary field crops.

294, 302, 551 Tropical products are gathered entirely by hand.

(e) Skill in Laborers

396, 487 Women and children often do a great deal of unskilled labor and are rated as cheap labor.

485, 119 In many cities a great many workers are idle and do not seem to be concerned about their living.

105 This is a good example of labor that has to be directed. Without a "boss" not much work would be done.

419 This is an illustration of how to get an important piece of work done by cheap labor.

47 The harvesting of cantaloupes and other truck crops requires more or less intelligence to know when the crop is ready for marketing.

136, 160, 177, 178, 180 The modern farmer needs to have skill in handling machinery.

(f) Keeping Labor Employed

130 One of the problems of the farmer is to furnish work which will keep him or his hired help busy the year around. The sugar-camp employs labor early in the spring before the field work can be done.

403 Dairying requires work the year around.

57 Where dairying is done on a large scale the milking is a part of the regular day's work.

44, 175 Fruit growing requires work practically all year. The winter season is taken up with pruning, spraying and making boxes and barrels for packing and shipping.

218 Grain farming furnishes labor only for short seasons. The remainder of the year there is little to do.

185 Winter feeding of stock furnishes profitable work for the farmer and his hired help.

II. TOOLS, IMPLEMENTS, AND FARM MACHINERY

As has been noted under Farm Management, the equipment of a farm has a great deal to do with the success or failure of its operations. Every farmer should strive to have enough machinery and tools to carry on his work effectively. Oftentimes loss is caused by not having enough equipment to put out a crop in proper season, or to harvest it when ripe.

On farms of large area and level surface, machinery of large capacity can be used to advantage, but on hilly farms and on small areas small sized machinery, or even hand tools, must be used. See Labor and Equipment.

1. HAND TOOLS

529 The oldest tool used for harvesting is the hand sickle. Less than an acre can be harvested in a day by one man. Consider how much more the farmer in 357 can do in a day.

388 The rough surface makes hand tools necessary here. The grass

has been cut with a scythe (the scythe was the first improvement over the sickle) and now it is being raked into bunches with hand rakes. Note how different this is from 181.

105 The hoe was the first cultivating tool and is still used on small areas. It is very effective for killing weeds and loosening the ground when vigorously used.

47, 108, 175 The basket is a very useful piece of farm equipment. The average mature person can handle a basketful of almost any article grown on the farm. Besides the basket is useful to gather articles into larger piles.

2. TRANSPORTATION

449 The most primitive method of transportation is on the human back. This method is laborious, slow, and capable of moving only small articles.

311, 396, 438, 454 The two-wheeled vehicle drawn by one or more animals is a great improvement over the "burden bearing" method.

124, 138 The most satisfactory means of transporting about the farm is the use of the two-horse wagon.

147, 177 When the wagon box is replaced by a hay-rack, or "hay-ladder," the wagon is useful in handling bulky material like hay, straw, or sheaves before they are threshed.

47 The one-horse wagon is very convenient on the farm and especially on a truck farm.

162 The sled is useful in handling timber in the forest.

3. TILLAGE IMPLEMENTS

488, 522, 561 Very crude types of plows. Only in very rich soil and with plenty of hand labor could such plowing of the ground produce a crop.

549 This harrow is much like a big, coarse comb and is adapted to the peculiar conditions under which the Filipino farmer works.

178 Here we see the most modern and up-to-date method of breaking the ground. This tractor is pulling three plows and doing the work of three two-horse teams and doing it quicker. One man can operate all the machinery and is thus saving the time and wages of two other men. This outfit will plow about one acre an hour.

179 It would take seven horses to draw the implements shown here and they would not be able to do it so quickly either.

180 Tractor and manure spreader. The tractor is of special value in plowing sod. The manure spreader scatters the manure evenly over the ground. The manure spreader pulls hard and when it is loaded furnishes a heavy load for a team.

332 The tractor is being used every place where large areas are to be prepared for crops.

198 The two-horse cultivator is the most common tool for cultivating crops.

4. HARVESTING MACHINERY

357 With the self-binder one man and a team do the work of a team and five or six men. This is an American binder at work in England. See the name Plano on the grain shield.

136 The corn binder is a much later invention than the wheat binder. The corn binder saves the labor of two or three men and a great deal of hard work.

160 This binder has an elevator attached which carries the corn up and drops it on the wagon. This saves the labor of two men necessary to gather the corn from the ground when it is dropped as in 136.

181 The hay loader is a great labor saver and also time saver.

166 The potato digger is also a great labor saver. The hardest work here is the picking up of the potatoes.

5. THRESHING MACHINERY

284, 497 It takes a long time to thresh a crop of grain in this way.

177 The primitive methods would thresh only a few bushels in a day, while an outfit like this will thresh more than a thousand and have the grain clean enough to go to market.

218 This machine harvests the heads of wheat, threshes the grain, and drops it into sacks for the teams to haul to market.

233 Here the horses are replaced by a steam engine. By using a tractor for preparing the seed bed and sowing the seed the grain farmer can handle large areas of farm land and not have a single horse.

6. MISCELLANEOUS

161 The power ditcher saves a great deal of man labor. Notice the peculiar wheels on this machine. They are called caterpillar wheels, and move the machine slowly. Such a machine and two men will dig the trench and lay the tile for 100 rods, three and a half feet deep, in a day.

44 The power sprayer enables the orchardist to spray several hundred trees in a day. The sprayer is mounted on a wagon and the gasoline engine seen at the back forces the spray out of the nozzles.

26. FARM HOME AND FARM LIFE

By A. E. WINSHIP, Litt.D., LL.D.

LECTURER, EDITOR "JOURNAL OF EDUCATION," BOSTON

Marvelous changes in country life have occurred in recent years. These have made great progress toward retaining all that is best and most wholesome in rural living conditions and at the same time they have eliminated much of the drudgery and isolation of former days. A new era is at hand. Fortunately, most of the labor saving devices not only make the work more pleasant but also far more profitable so that the luxuries of yesterday are becoming the commonplaces of today.

The country will never retain its boys and girls merely because they can get a good start in life easier there than in the city, nor merely because it is more and more profitable to live in the country. Boys and girls must learn to love the country in childhood and youth. They must be given real opportunity for the joys of childhood in the country. Days of hard work must be limited as to hours. Life must not be all drudgery.

Most men who flee from the country safety to city dangers are usually ticketed for the city by the poky life they lead in the country home. Nowhere is social live so easily made safe or so attractive as in the country, and no homes need the illustrated weekly and monthly magazines, music and other forms of pleasant recreation as do those in the country.

The automobile is doing its full share to overcome the isolation of rural life. It is not without significance that our greatest farming states have the greatest number of automobiles per thousand of population. The telephone, the trolley line and the daily mail delivery bring the farm into close touch with the community, the county and the outside world. The self binder, the hay loader and stacker, the silo, the cream

separator, the tractor and the whole range of modern improvements make for efficiency and profit in farm life.

With families of the same means a country home can be made infinitely more attractive than a city home. Nothing homey is possible in a large city for a family of small income, while in the country even with a small income a place can easily be made very attractive and homelike. Cleaning up and dressing up for the evening meal will greatly help to make a country home attractive. Be sure that the whole family eat the evening meal together and that all sit at the table until all are through. The evening should have something especially attractive to the whole family. In summer time out-of-the-house social life should be promoted.

Appreciation of nature is of first importance in the country. With teeming life growing and unfolding on every hand, there is that intimate association with nature that lifts one's mind to the higher and nobler things of life. Nowhere else is right living and high thinking so easily attained as in farm life; nowhere else is faith in human nature so significant.

1. THE FARM HOME

91 White House, 96 Washington's old home. The city at its best can show no lovelier homes than the country. Washington, when President, used to long for the time when he could return to his country home at Mount Vernon.

37 Newburg, N. Y., 38 Hudson Valley, 262 Nova Scotia. The quiet beauty and prosperity of farm homes such as we see here is very attractive. There is no smoke, no dirt, no neighbor so close as to be almost in your own house.

102 North Carolina. Can you imagine anything more beautiful than this view which can be seen from this farm home? Travelers come hundreds of miles to see it.

367 Stirling Castle. The nobility of the British Isles, even the royal family, have homes in the country.

362 Wordsworth's home, 372 Burns' cottage. Very many of the great poets have lived in the country and found their inspiration there.

373 Highland home. This simple home in the Scotch Highlands seems to radiate contentment and cleanliness.

113 Lincoln cabin. In the pioneer days of our country, this was a common kind of home and some people still think of a farmhouse as a place without comfort or conveniences.

147 Illinois. This kind of a farmhouse is far more frequently seen than the one above.

181 W. J. Bryan's home. You would expect a great man's farm to be up-to-date. This one has a windmill which pumps water for

use in the house and barns. Very many farmhouses now have bathrooms and all the sanitary appliances of the best city homes.

236 Vineyard, Cal. Here is another modern farmhouse with modern conveniences. When the grapes are ripe the air is full of delicious fragrance, very different from the odor of a city street.

2. INDEPENDENCE

The farmer is the most independent of men for his farm supplies most of his living. If he is thrifty and wise, his food is the freshest and best.

57, 159, 364, 371 Dairy cattle. The country home is always supplied with milk and cream and fresh butter.

183, 172 Hogs, 185, 358 Beef cattle. Very often the farmer raises and prepares his own meat. Home cured hams, home made sausage and such things are delicious indeed.

141, 142, 143, 144 Packing house scenes. This kind of work in a crowded city cannot be half so pleasant nor so satisfactory as raising the live animals in the open, sunny fields.

56 Poultry. Every farm can have its chickens and fresh eggs.

83 School garden, 149 Celery field. Vegetables fresh from the garden have a much finer flavor than those which have stood in markets and stores.

166 Digging potatoes. A farmer seldom if ever buys potatoes.

47 Cantaloupes, 85 Peaches, 175 Apples. It is very pleasant to pick ripe fruit and have it fresh every day. The farmhouse cellar is always rich with fruit stored away for winter.

147 Oats, 184 Corn, 357 Wheat. The farmer also raises grain for his family bread and to feed his livestock.

130 Tapping sugar maple. The Indians showed the first white settlers how to make maple sugar. A maple sugar camp in the woods in the early spring is a delightful place.

137 Pumpkins. With his milk and eggs, the farmer must of course raise pumpkins for pie and for food for his cattle.

85 Delaware. 112 Kentucky. 149 Michigan. 136 Indiana. 160, 161 Wisconsin. 178, 179 South Dakota. Usually the farmer is his own boss. He is working for himself and his family and this adds zest to life.

3. CHILDREN

The country is an ideal place for children.

72 Daisy pole. Children love the wild flowers and are so safe in their play. They roam through the fields and woods.

359 Nightingale. They see the birds and animals in their native homes and learn their ways.

2 Wild moose; 189 Wild elk; 359 Nightingale; 583 Gannets; 584 Penguins. Sights of this kind are never seen in cities.

83 City school gardens. Country children are not confined to a tiny patch of garden.

236 Vineyard, California. They share in the life of the whole farm.
522 Chinese farm scene, 239 Ostrich farm. Children seem especially interested in little animals of all kinds. Calves, lambs, colts, as well as little ostriches, delight them.
56 Chicken farm. Very many country children like to gather eggs and feed chickens.
455 Palermo, Sicily. It seems too bad that the little children of the tenements cannot play with the flowers and birds in the sunny fields.

4. SCIENCE

Sometimes farmers as a class have been looked upon as ignorant and unprogressive. If that ever were true, it is not so today. It takes real mental vigor to be an up-to-date farmer.

93 Overlooking Agricultural Department and grounds, Washington, D. C. In the Agricultural Department trained men are continually studying and supervising experiments for the benefit of the people of the United States.
172, 173 Ames, Ia. Several colleges are devoted to agriculture and in them men and women are especially taught the best methods of farming. Nearly all our colleges have courses in agriculture.
83 Philadelphia. Because the tilling of the soil is necessary to the life of the people, and for its educational value, even the public schools are teaching it.
235 Improving plants already known and developing new varieties that will be useful is an important interest of agricultural science today.
44 Spraying apple trees. Spraying prevents disease and saves millions of dollars' worth of fruit each year.
175 Picking apples. It is nice to sort fragrant apples in the orchard.
115 Phosphate, 180 Manure, 183 Nitrogen-fixing plants. The scientific farmer of today studies his soil and applies the kind of fertilizer needed.
57, 159, 165, 364, 371 Dairy cows, 185, 358, 370 Beef cattle, 138, 398 Draft horses, 172, 183 Hogs, 173 Sheep. The scientific farmer breeds his stock to suit the purposes he intends. Men enjoy greatly the owning and handling of fine stock.
161 Draining land. Also the farmer must be somewhat of a civil engineer to drain his land where it is too wet, or to lay out his ditches so as to irrigate it if too dry.

5. THE METHODS OF WORKING

A large part of the farm work of the United States is done by machinery. The farmer of today must be a mechanic.

388 Hay making, Germany. Here we see the old way of making hay. When work has to be done by hand, only small fields can be cared for.

181 Hay loader, Nebraska. This is the American way. It does away with the continuous lifting.

561 Primitive plowing. This kind of plow has been in use in Egypt over 5000 years. There has been no improvement.

522 Plowing, China. And this is a fair sample of plowing in China.

488 Plowing, Russia. This plow may not last much longer, as Russia is importing great quantities of American farm machinery. These scenes show how our ancestors worked.

178, 179, 180 Tractors. This is the way the great fields of the western United States are plowed and prepared for seed.

66, 67 Steel works. 178, 180 Farming. Driving the tractor in the open air and sunshine seems much pleasanter and more healthful than the hot, dangerous iron mill.

149 Celery, 68 Coke. These pictures show out-of-doors work but certainly the farmer has the best of it.

529 Cutting rice. All grain was harvested with a sickle in ancient times. It was very slow and laborious. The scythe and cradle seemed a wonderful invention.

357 Harvesting wheat. The reaper and binder greatly lessen the work of the harvest.

199 Shocking wheat. Then the bundles must be set up to dry.

147 Loading oats. Later they must be hauled to the barns to be threshed.

284, 479, 497, 562 Primitive threshing. This way of threshing has been used by all primitive people. It must be pleasant, this leisurely work in the open air, but it is very inefficient.

177 Threshing wheat. The modern American way is efficient. See the mountain of straw that may be made into paper, or used to bed animals or perhaps be returned to the land as a fertilizer — unfortunately, at times it is burned.

3, 4 Quarrying, 41 Factory, 156 Smelting, 177 Threshing. All these pictures show work that is hard for the lungs because of dust or vapors. The threshing has the advantage of being in the open air where the wind can blow the dust away from the workers.

218, 233 Harvesting wheat. Sometimes reaping and threshing is done by one machine. Only the heads of the grain are cut off leaving the straw to be plowed under.

76 Anthracite, 155 Copper mining. Who would choose to work in a mine underground, when he might be raising corn?

184 Corn field, Kansas. There is no lovelier sight than a field of waving corn. This grain makes a wonderful return to the planter.

160, 136 Corn harvesting. Corn is now cut and cared for by machinery making the farmer's work much lighter and the returns much greater.

47, 149 Market gardening is very profitable near large cities and very attractive work.

419 Sugar beets. Weeding done by hand is very tiresome. Yet is it more so than shopwork?

18, 23, 24, 86 Factory scenes. Here one must sit or stand all day in a closed room with the dust and rattle and jar of machinery and the discomfort of bad air.

198 Cultivating beets, Colorado. Fortunately, in America, the cultivator drawn by horses makes handwork less necessary. This man seems to be enjoying his work.

44 Spraying apple orchard. Fruit raising is a most attractive kind of farm work. Along the lake shore where this picture was taken the air is filled with the scent of fruit from cherry blossom time till apples are gathered.

85, 44, 175 Apple and peach orchards. Trees are no longer just let grow. They are now carefully attended and the perfect fruit fully repays the work.

237 Oranges. Careful cultivation such as is shown in this picture is hard work. But in such a place with such a view to rest one's eyes, we find hard work in its pleasantest form.

238 Oranges, 236 Grapes, 234 Almonds. One of the joys of farming lies in the fact that the farmer sees the finished product of his labor.

11, 12, 41 Shoe manufacture. These people who are skilled workmen do only one thing day after day. The monotony is wearing.

159, 165, 185, 358, 364, 370, 371 Well bred cattle. All over the civilized world men take pride in breeding fine cattle.

57, 46 Modern dairying. Can you even imagine what we should do without milk? Because the health of the whole people depends largely on the milk greatest care is taken that it may be healthful.

127, 186, 188 United States, 301 Jamaica, 589 Australia. Some men love the wild, free life of the cattle or horse ranch with the riding and open air.

173 Ames, Ia. 190 Idaho. Most farmers keep a few sheep. But in the west vast flocks containing thousands roam over the land. Tending the flocks was one of man's earliest occupations. The life out in the open under the skies brings man in close harmony with nature and with nature's God. Shepherd peoples have been notably religious peoples. It was not without reason that the Good News came first to the shepherds tending their flocks on the plains of Bethlehem.

104, 105 Rice, 112 Tobacco, 117 Cotton, 118 Peanuts. Negroes are especially adapted to the farm work in the south. Their original home was in the torrid zone and they thrive best in the warmer lands.

104, 105, 528, 527, 529 Rice farming. These five views of rice growing present vastly different conditions.

6. SOCIAL SIDE OF COUNTRY LIFE

72 Daisy pole. The country is a good place for children and pleasure parties.

118 Arkansas; 113 Lincoln's cabin. Very many city people think of farmers as living in homes like these and under poor conditions. Nothing is farther from the truth today.

45, 46, 47 New York. 56 New Jersey. 124 Texas. 165 Minnesota. 180 Nebraska. 184, 185 Kansas. 177 North Dakota. 175 Missouri. These and many other views show that farmers are not necessarily poor.

150, 151, 152 Automobile factories. An increasing number have automobiles. These carry them so quickly to and from the city that farmers may be said to have all the best advantages of city and country.

71 Pennsylvania. Good roads have done much to make country life easier.

166 Minnesota. The harvesting of a crop brings the country people together.

218, 233, 177 Threshing in the country is the occasion for exchange of work which unites the farmers and emphasizes community feeling.

188, 186, 127 Men on big ranches become like a large family.

210 Arizona. 198 Colorado. 236, 237 California. In irrigated districts the people live close together on small plats which are intensively cultivated with the most improved machinery. There is a community of interest not known in more favored sections. This often results in city improvements for the district such as the best of schools, electric lights, etc.

211 New Mexico. 199 Colorado. 224, 225 Oregon. The sparsely settled western communities have a friendliness not known in the more densely populated regions.

178, 179, 102, 103 Distance from cities causes the farmers to club together in ordering goods from mail order houses.

38 Hudson Valley. Farmers in a progressive community are usually organized into a grange for social and economical purposes.

195 Yellowstone. 201 Colorado. 207, 208 Arizona. 221 Oregon. 228, 229 Yosemite. After the crops are cared for very many farm people travel to see their country.

93, 173 The Agricultural Department, and Agricultural Colleges send out men to hold meetings which are very enjoyable and profitable. They promote sociability and impart the knowledge that makes improved farm conditions possible.

172, 183 Hogs. Pig clubs are likewise efficient in improving animal husbandry and at the same time through the club meetings provide social opportunities.

184 Corn field, Kans. 136 Harvesting corn. Corn clubs have given young people a greater interest in agriculture. They make for improved farming conditions and afford many social occasions. Other products than corn are equally available for club work. Canning clubs also serve the double purpose of forwarding the work in Domestic Science and promoting sociability.

96 George Washington after he had been through the Revolution and had served as President said he saw no way of doing more service for his country than by improving its agriculture.

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THE PUBLISHERS.

NATURE STUDY

INTRODUCTION

By ERNEST THOMPSON SETON

NATURALIST AND AUTHOR, GREENWICH, CONN. FOUNDER AND CHIEF WOODCRAFT LEAGUE

An ideal recreation is one which combines exercise of body, brain and senses with profit and interest that begets enthusiasm which creates perseverance; one which gives variety, outdoor activity and in which, above all things, teachers and scholars of all ages can go together,— both of them making discoveries. Surely Nature Study is the one, perhaps the only one, that completely fits these requirements, and whether we focus our power on animal or plant life, we find opportunity for exercise and discovery that never loses its zest. For this is a well known secret: The naturalist never grows old.

Because the eye gate is the main entrance for nature lore, we find our series of views of prime importance in making the acquaintance of the living things of our world. Your attitude will have much to do with your pleasure and your progress.

If you wish to enjoy these pictures that set before you the ways of the animal world, begin by realizing that the animals and ourselves are very much alike. That they have been evolving for ages, much as we have done, only we have gone farther on the road of mind growth; our faculties are far beyond theirs, but their senses, in most cases, are much more acute than ours.

The hearing of a dog or a fox is far better than that of a man, and the sense of smell of these creatures is as superior to that of man as the speed of an eagle is beyond that of a mud turtle.

Man has, perhaps, better eyesight than a dog, but the birds

are as superior to man in this department as the dog is in smell sense.

In touch sense man is well developed, better than most big animals, but is probably far inferior to such delicate things as mice and insects; the same remark applies to taste. There are yet other senses, less generally discussed, such as direction, electric sense, etc., in which the animals seem far better equipped than we; and the sum total of such observations leaves us convinced that both we and our wild brothers have struggled along in the ages of evolution, each fighting the same battle, only we had the luck to find a higher trail and with that reach a plane of higher joy and larger sorrows.

This thought of kinship enlarges our sympathies, but we should not obscure the fact of man's supremacy and his right of eminent domain.

We are justified in using all the animal kingdom for our lives and comfort; but every law of profit, logic, and goodness forbids the infliction of unnecessary cruelty or destruction.

What America is suffering today from the wanton destruction of birds and wild life, should be a lasting warning, and solemn admonition to repair at once the damage — restore again the bird life whose loss is robbing us of our forests, or an even larger calamity shall be our inevitable and national punishment.

It was recognition of the close relationship of forests and animals that led to their being grouped together as Nature Study. An utter novice has no difficulty in telling you the difference between plants and animals; a trained naturalist is not so sure. The difference between a man and an oak is very obvious, but lower down in the scale we have animals which sprout into two and we also have sensitive plants that behave like animals; so that the dividing line is much discussed if it exists at all.

The animal, being nearer to man has usually first claim on the interest of the young naturalist; but, strange to tell, I know of some men who began by studying birds and quadrupeds and later drifted away to trees and plants; the reason given being: The latter are easier to study; they do not run and hide when you wish to be with them, and they respond so much better to attempts to cultivate and propagate them.

27. PLANTS AND PLANT ASSOCIATIONS

By JOHN M. COULTER, Ph.D.
PROFESSOR AND HEAD DEPT. OF BOTANY, UNIVERSITY OF CHICAGO

Assisted by GEORGE D. FULLER, Ph.D.
INSTRUCTOR IN PLANT ECOLOGY, UNIVERSITY OF CHICAGO

I. PLANT ASSOCIATIONS

Plants are not scattered indiscriminately over the surface of the earth, but live together in definite communities called associations. For example, forests, meadows, swamps, are plant associations, each determined by the conditions for plant life. The factors whose combination determines what plants can live on a given area are water, temperature, soil, light, wind, etc.

The most conspicuous plant association is the forest, in which trees are the dominant plants. The forest is called the climax type because in the history of every region there is a succession of plant associations, and the final association is some form of forest. A great many areas have not yet reached the forest stage. The kind of forest depends upon the region and its history.

A. TROPICAL FORESTS

Abundance of rain, a continuous growing season, and high temperature give the richest and most luxuriant of forests. They have thin, broad evergreen leaves; the trees are often not large but of many diverse kinds, growing crowded together with entangling vines and abundant herbaceous plants.

255 Rich tropical forests are seen near the Panama Canal.

592 Fiji Islands. The even temperature of the south Pacific Ocean induces the development of rich evergreen forests.

247 Panama. The rubber tree grows in such rich forests. Ferns growing perched on the trunks of palms are often found in tropical forests.

259, 294, 570 Bananas are among the most useful trees of the tropical forests, as they supply materials for houses, baskets, and for food. Note their broad leaves.

307 Rio de Janeiro, Brazil. Some of the richest tropical forests in

the world are in Brazil. This view is in a somewhat drier region, but the trees are still evergreen.

B. SEMITROPICAL FORESTS

576, 577, 574 When the rainfall is not quite sufficient, or some other conditions are less favorable, a less luxuriant forest develops. Palms often grow in such a forest.

575 Near Victoria Falls, Rhodesia, Africa. A moderate amount of rain in the tropics gives only a poor, often scrubby forest.

C. GLOSSY-LEAVED FORESTS

In lands with hot dry summers and cold wet winters, the evergreen trees often have hard shining leaves, such as those of the olive, orange, and tea.

238 Oranges; 480, olive grove in distance; 530, tea.

D. TEMPERATE EVERGEEN FORESTS

376, 377 The climate is so mild in Killarney and neighboring parts of Ireland that many semitropical plants grow freely, and evergreen shrubs and vines are abundant. One reason for the name "Emerald Isle" is to be found in these evergreen forests.

E. CONIFER FORESTS

The cone-bearing trees form some of the most valuable forests in the world. The most important kinds are the pines, spruces, and firs. They are evergreen, holding their small needle-like leaves for several years, and are found in lands of cold winters and warm moist summers.

224, 215, 216 The richest conifer forests in the world are those of the Pacific Coast. They are composed of Douglas fir, hemlock, tide water spruce, western cedar, and western larch. They produce more lumber per square mile than any other forests in the world.

Mountain Forests

195, 196, 222 In the mountains of the west the most abundant forests are often those composed of spruce and fir.

221, 409, 427, 445 Many mountain sides have rich forests of pine, spruce and fir.

Pine Forests

162, 221 Pine forests of the northern United States have been valuable but are being rapidly cut over.

Southern Pine Forests

107 The longleaf or Georgia pine has for several years furnished the largest cut of pine lumber in the United States. See also Yellow Pine Forests following.

Northern Forests

1, 246 The forests of Maine, Alaska, and Canada are often largely made up of white spruce and balsam fir.

Bigtree Forests

229 The mountains of California have rich forests of pine and fir encircling the giant Sequoias or "big trees."

European Pine Forests

388 Germany has carefully preserved and cared for her pine forests.

Yellow Pine Forests

191, 201, 228 On the slopes of many mountains of the United States yellow pine forms valuable but rather open forests. See also southern pine forests above.

Pinon Forests

201, 206, 211 Even the semiarid slopes of the southwestern United States have scrub forests of nut, pine and junipers.

Scrubby Forests

200, 201, 228 Scrub oaks often mingle with pines in a scanty forest in dry regions.

Mixed Forests

162 Evergreen and deciduous trees often form mixed forests.

Petrified Forests

206 Trees have turned to rock in the petrified forest of Arizona. The climate has evidently changed for at present the only trees growing there are scrubby junipers.

Zonation of Forests

221, 228, 445 Forest zonation is shown on many mountains and high cliffs. Often the more open pine forests are at the base of the mountains and the richer spruce and fir forests above.

213 When the mountain is in an arid region the forests are limited to the higher parts, where moisture is secured from clouds.

408, 409 Sometimes only the lower parts of the mountain are covered with forests of spruce and fir. The snow remains too long upon the higher parts to allow trees to grow.

Pioneer Forests

39, 51, 191 Forests often have a difficult time becoming established on rocky cliffs and hill sides.

Arctic Forests

413 As the Arctic circle is approached the trees become low and stunted because of the short season, the cold and the strong winds.

F. DECIDUOUS FORESTS

In the lands where there is a season too cold or too dry for trees to grow continuously, the forests shed their leaves at a certain time of the year, usually in the fall.

Climax Forests

38, 70, 73, 130, 169 Many rich forests of this type are found in the United States. They abound in beech, maple, oak, tulip, chestnut and other trees.

Oak Forests

361, 369, 379 Rich forests of oak, ash, and similar trees once covered much of the British Isles, and a few bits still remain.

103, 114 Oak forests are among the most useful.

Flood Plain Forests

470 The rich soil of flood plains often has forests of great luxuriance.

Stream-side Forests

2, 120, 173 Along the water's edge willows and alders are common trees.

Japanese Forests

525, 527, 529 The forests of Japan are very similar to those of the eastern United States. They contain considerable pine, spruce and fir.

New Zealand Forests

591 Those of New Zealand are rich, containing both conifers and broad-leaved trees.

G. GRASSLANDS

Natural grasslands are usually found in regions where the rainfall is not sufficient to produce forests. They naturally become the feeding grounds of herds of cattle, horses, and sheep.

Prairies

178, 179, 180, 181 These are the richest of the grasslands and are abundantly developed in the central United States.

Pastures

73, 173, 183, 301, 480, 589 Their grasses are both native and introduced.

127, 188, 190, 589 Scanty rainfall in mountainous regions makes the grasses short and scanty.

Lawns and Parks

37, 316, 482, 586, 587 These show by their close turf the effect of good care and constant water supply.

Forest and Grassland

38 This is the usual type of landscape in the eastern United States. Farther to the west, in the prairie regions, trees are usually found only along the banks of streams as in 182.

II. DEFINITELY IDENTIFIED PLANTS

A. TREES — CONIFERS

162 (lower right), 265 White pine (*Pinus strobus*) has been the most valuable tree in North America, but few large forests of it remain.

191 (in valley), 200, 201 (on top of ridge), 228 (in valley). Yellow pine (*Pinus ponderosa*), the most valuable pine tree of the western portions of the United States.

107 Georgia pine (*Pinus palustris*), also called long-leaf pine. Now the most valuable pine in the United States, growing upon the sandy plains of the southeast and yielding lumber, resin, turpentine, and fiber (from needles). It is a yellow pine.

388, 407, 418 Scotch pine (*Pinus silvestris*), the most valuable pine of Europe.

427, 428, 449 Mountain pine (*Pinus montana*), common on the high mountains of Europe.

201 (on slope), 211 (on hill) Nut pine (*Pinus edules*), a small scrubby tree with nutlike edible fruit.

1, 262 White spruce (*Picea canadensis*) a tree of the northern United States and Canada, valuable for lumber and for paper pulp.

246 Alaska spruce (*Picea sitchensis*) also known as tide water spruce, a tall tree growing along the coast from Alaska to Washington.

412 Norway spruce (*Picea excelsa*), one of the valuable trees of northern Europe. Often planted for ornament in America.

162 (one tree in center) Balsam fir (*Abies balsamea*), used for pulp wood.

222, 228 (on higher parts) Red fir (*Abies magnifica*), a fine tall tree of western mountains.

191, 276 Mountain Balsam fir (*Abies lasiocarpa*), a tall slender tree common in the higher parts of the Rocky Mountains.

216, 224 Douglas fir (*Pseudotsuga Douglasii*), also called red fir and Oregon pine, is the most valuable and one of the largest trees on the Pacific coast.

206 Arizona juniper (*Juniperus monosperma*), a small scrubby tree of the arid southwest of the United States.

229 Bigtree (*Sequoia gigantea*), the largest and oldest tree in America. It attains an age of 1300 years, a height of 300 feet, and a diameter of 35 feet.

B. TREES — BROAD-LEAVED

249, 259, 551, 574 Cocoanut palm (*Cocos nucifera*), a tree that supplies building material (stems), thatch (leaves), fiber (husk of nut) food, and drink (nuts). It is widespread in tropical lands.

556, 566 Date palm (*Phœnix dactylifera*), a most valuable tree, furnishing food in many semi-desert parts of Asia and Africa.

294, 297, 302 Banana (*Musa sapientum*), a very broad-leaved tropical fruit tree.

552, 553 Manila hemp (*Musa textilis*), a broad-leaved tree of the banana family, whose leaves and petioles yield a valuable fiber.

120, 173 Black willow (*Salix nigra*), a common tree along stream borders.

182 Cottonwood (*Populus deltoides*), grown along streams even in prairies and desert regions.

466, 489 Lombardy poplar (*Populus nigra italica*), a tall tree of remarkably upright growth, a native of Europe but much planted in America.

1, 162 Paper or Canoe birch (*Betula papyrifera*), a hardy tree with papery white bark. 263 shows the bark of this tree used by Indians for tent covering.

10, 37, 71, 96 American elm (*Ulmus americana*).

146 White Oak (*Quercus alba*) in background.

537, 538 Silk mulberry (*Morus alba*), a small tree cultivated for its leaves, which are fed to silk worms.

70 Chestnut (*Castanea dentata*). It often produces shoots from the base of the trunk.

130 Sugar maple (*Acer saccharum*), valuable both for wood and for the production of sugar.

379 Box tree (*Buxus sempervirens*), a small tree with glossy evergreen leaves. Often trimmed into ornamental shapes and used in hedges.

534 Flowering cherry (*Prunus pseudo-cerasus*), much grown for ornamental purposes in Japan.

259 The papaw (*Carica papaya*), a very broad-leaved tree grown in many tropical lands for its fruit.

480, 485 The olive (*Olea europaea*), an evergreen tree of the Mediterranean region.

489 The fig (*Ficus carica*). Three trees in foreground.

237, 238, 437 The orange (*Citrus aurantium*), a tree with glossy evergreen leaves, valuable for ornamental purposes and for its fruit.

209 The Mesquite (*Prosopis glandulosa*) is one of the largest trees of the Arizona deserts. It belongs to the pea family.

44 The apple (*Pyrus malus*) is usually seen in orchards only.

85 The peach (*Prunus persica*).

234 The almond (*Prunus amygdalus*).

303 Cacao tree (*Theobroma cacao*).

302 The coffee (*Coffea arabica*) is a small tree with evergreen leaves.

293 Mango tree (*Mangifera indica*) bears one of the most highly prized fruits of the tropics.

530 Tea (*Thea sinensis*) is from a small evergreen tree.

209 Giant cactus (*Cereus giganteus*), the giant of the deserts, growing to a height of 35 feet.

C. SHRUBS

355 European privet (*Ligustrum vulgare*) much grown for hedges.
362, 379 Rhododendrons are fine evergreen shrubs with beautiful flowers.
188, 190 Sage brush (*Artemisia tridentata*).
209 Creosote bush (*Covillea mexicano*), one of the small shrubs common in the deserts of the southwestern United States.

D. VINES

37 Boston Ivy (*Psedera tricuspidata*), a hardy vine from Japan, much grown in Boston and the New England States.
354, 362, 376 English ivy (*Hedera helix*) grows abundantly upon the houses and castles of the British Isles. The "Ivy" of literature.
236, 319, 390 Grape (*Vitis vinifera*), excellent as an ornamental vine as well as for its fruit.
137 Pumpkins (*Cucurbita pepo*).
47 Cantaloupe (*Cucumis melo*).
359 Gill-over-the-ground (*Nepeta glechoma*).

E. HERBS

37, 285, 287 Century plant (*Agave americana*).
91 Cannas (*Canna glauca, C. annaei, and hybrids*).
258, 333 Sugar cane (*Saccharum officinarum*).
136, 184 Corn (*Zea mays*).
172 Rape (*Brassica campestris*).
297, 112 Tobacco (*Nicotiana tabacum*).
198, 270, 419 Sugar beet (*Beta vulgaris*).
72, 102 Daisy (*Chrysanthemum leucanthemum*).

III. CONDITIONS UNFAVORABLE FOR PLANT LIFE

Although vegetation covers most of the earth's surface, there are certain areas in which plants grow with difficulty. The result is a scanty vegetation made up of a few kinds of plants that are specially fitted to endure the hard conditions. The principal unfavorable conditions appear in the following classification.

A. TOO DRY

Deserts

209, 563, 565 Where rain seldom falls only a few hardy plants survive.

Semi-deserts

190, 200, 201, 495 With scanty rainfall a scanty vegetation results. Small trees scattered widely over the soil use all the meager rainfall.

Dwarf Trees

535 The Japanese by planting trees in pots and limiting the supply of water so that life is barely maintained, produce curious dwarf trees. Individuals 12–18 inches high may be a century old.

B. TOO WET

161 Too much water is almost as bad as too little, but drainage will improve this condition.

C. TOO COLD

Arctic Snows

243, 342, 345, 346 Near the poles the continuous cold excludes all plants.

Alpine Deserts

219, 276, 279, 322, 323, 440, 441, 448 Where the perpetual snow covers the mountain tops plants are absent.

Arctic Forests

244, 413 The cold winds make low shrubbery forests.

Ice Burden

50, 191 Snow and ice crush trees and break off branches.

D. TOO MUCH INJURIOUS GAS

62, 63, 68, 187 Smelters, coke ovens, and other industrial plants often send forth great volumes of fumes and gases. These are destructive to vegetation and wasteful as well, resulting in the loss of millions of dollars' worth of valuable chemicals that might be reclaimed by proper methods.

453, 300 Volcanoes emit great volumes of poisonous gas.

City Conditions

6, 26, 27, 48, 61 The soil in the city is often too dry as the water is carried off in sewers. The houses crowd out plants, and smoke and gases destroy the foliage.

E. TOO LITTLE SOIL

Rock Plants

189, 208 Rocks permit few plants except mosses and lichens to flourish. A few find a foothold in cracks and crevices and gradually form more soil.

Pioneer Plants

197, 191, 51 Forests slowly conquer steep cliffs and hillsides, but the pioneers have a hard struggle.

On Ruins

478, 281, 284 As stone houses, castles and other stone structures fall to ruins, plants find resting places in shelves and crevices. They aid in breaking up the stones, forming soil and crumbling the building to the ground.

F. TOO UNSTABLE SOIL

Steam Erosion

191, 197, 207, 208 As rivers cut away their banks the vegetation is destroyed. Plants find the crumbling soil precarious footing.

Volcanic Hills

453 The ash and cinders from volcanic action make plant life difficult and uncertain.

Sand Dunes

223 The wind moves the sand so readily that no plants can live.

IV. WATER RELATIONS OF PLANTS

Probably the greatest of all dangers to plants is the lack of sufficient water. For deficiency in supply see under Conditions Unfavorable for Plant Life. The use and economy of the water supply is largely determined by the foliage condition of the plant.

Broad thin leaves lose water rapidly. Such leaves are seen in: 160, Corn; 294, 297, 302, Bananas; 258, 333, Sugar cane; 259, Papaw; 172, Rape.

Tropical evergreen forests abound in broad thin leaves using water freely. See under Tropical Forest.

237, 238, 530 In lands with hot dry summers and cool winters the leaves are often evergreen, but have glossy surfaces which prevent the rapid loss of water.

224, 388, 591 When the winters are cold, such evergreen leaves are reduced in size to mere needles.

249, 259, 301, 574 Palms have large leaves, but they have a hard surface which retains water well.

10, 427 In lands with cold winters, many trees conserve their water by shedding their leaves in the autumn. See also under Deciduous Forests.

209 Desert trees often retain their leaves only during a few weeks when moisture is most abundant.

188, 190 Sometimes, as in the case of the sage brush, the small leaves which constitute the foliage are covered with a thick coating of hairs that helps them to retain the water.

209, 211, 235, 281 The greatest economy of water in perennial plants is seen in Cacti, with no leaves and thick juicy stems. Some will live for more than a year upon the stored water they contain.

V. LIGHT RELATION OF LEAVES

From the carbon dioxide of the atmosphere and the water of the soil green plants are continually making food. The energy for this manufacture comes from the sunlight, and to obtain this sunlight many differences in leaf size and leaf arrangement show their success by the large areas of the earth's surface they cover.

294, 297, 302, Bananas; 112, 297, Tobacco; 259, Papaw; 249, 259, 301, 574, 556, Palms. Large broad leaves work well where water is abundant.

247, 255,592 Broad thin leaves seen in tropical forests work efficiently every day of the year.

237, 238, 437 Hard glossy leaves, being able to cling to the trees during the hot summers, are often very efficient.

169, 87, 70 Some trees, although only retaining their leaves during the summer, have large broad ones and so possess a good working capacity.

182, 537, 120 Some deciduous trees have smaller leaves but still thrive.

224, 229, 591 The conifers have small needle-shaped leaves, but by retaining them for years do efficient work.

161, 173, 175, etc. The long ribbon-like leaves of the grasses cover vast areas of the earth's surface, testifying to their success. See Grasslands.

160, 258, 333 Corn and sugar cane expose great areas of green leaf surface.

181, 183, 317 Alfalfa is successful with innumerable small leaves.

571 Rosettes of leaves seen in a favorite type of arrangement.

556, 564, 566, 574 Rosettes on the top of long stems are probably still more effective.

47 Cantaloupes. Mosaics over the ground are formed by many vines.

37, 354, 362, 376 Mosaics upon walls give climbers good leaf exposure.

224, 388, 591 Small leaves of pines and other conifers let light pass through to reach those below.

209, 211, 235, 281 Cacti have usually no leaves, the leaf work being done by the fleshy stems.

VI. FOOD STORAGE

The manufacture of food by the leaves of green plants not only provides for the growth of the plant itself, but there is frequently a surplus supply stored in some of its organs. This food takes various forms.

285, 287 Water storage occurs in thick leaves, such as those of the century plant, or in the stems of cacti (209, 211, 235, 281).

551. Water storage also occurs in cocoanuts and in juicy fruits. See Fruits.

Sugar is stored in fruits (which see) and also in the sugar maple.

130 Sugar maple; 198, 270, 419, Sugar beets; 258, 333, Sugar cane.

Starch storage is most abundant in cereals and grains (which see).

166 Starch also abounds in the potato.

Protein storage is most abundant in nuts, such as: Peanut, 118; Almond, 234; also in beans, 562.

Oil abounds in: 480, 495, Olive; 118, Peanut; 303, Cocoanut.

Drugs and flavors are stored in: 112, 297, Tobacco; 530, Tea; 302, Coffee; 303, Chocolate; 259, Papaw (pepsin); 108, Pineapple (pepsin).

VII. ECONOMIC PLANTS

See classifications on Production and Manufacturing, and Farm Crops, Horticulture and Textiles and Clothing.

VIII. PLANTS FOR ORNAMENT

For classication dealing with plants for ornament see Horticulture.

Note: — A more complete series on economic botany may be secured by consulting the extensive list of industrial sets contained in the company's General Catalog. This catalog will be sent free of cost on request.

THE PUBLISHERS.

28. ANIMALS

By ERNEST THOMPSON SETON

NATURALIST AND AUTHOR, GREENWICH, CONN. FOUNDER AND CHIEF WOODCRAFT LEAGUE

I. HORSES

We do not know whether the horse was first used as a saddle beast or as a draft animal; but probably it served as a pack animal before it was either of the others. The pack of camp stuff was naturally followed by the human rider, and later some rude kind of drag was invented. Just as the travois of our Indians was evolved from the tepee poles being hauled from camp to camp. But men must have had roads before they had wheel vehicles, and that was a long time later.

In the most primitive form of agriculture the donkey and the ox are found in service, but one is too small and the other too slow for the best results. It is a remarkable fact that agriculture cannot flourish without the horse.

(A) DRAFT AND FARM HORSES

It is difficult to believe that the magnificent elephantine draft horses are from the same stock as the Shetland pony; but it is generally conceded that such is the case, and it illustrates what can be done by selective breeding.

138 A champion team of Percheron draft horses.
398 Belgian draft horses, world champion in foreground.
71 A fine 6-horse Percheron team.
218 A 20-horse team on combined reaper and thresher.
166 Three fine 4-horse teams on Minnesota farm.
147 A good road and farm team.
149 A good truck farm team.
136 Percheron horses excellent for heavy work.
180 Horses still necessary on modern farm.
42 Percheron draft horses.
198 A good farm team, Colorado.
162 Hauling logs, Minnesota Pineries.
181 Horses hauling hay, Nebraska.
177 Horses hauling grain to thresher, North Dakota.
226 Teams used to haul in salmon nets.
357 Harvesting wheat, England.
488 Russian peasant plowing.
497 Horses treading out grain, Palestine.

537 Horse as pack animal in Japan.
167 Draft horses, Minneapolis; 273 Winnipeg; 424 Paris; 454 Naples; 406 Copenhagen; 420 Gothenburg; 484 Nizhni Novgorod.

(B) ROAD AND CARRIAGE HORSES

195 Stage teams, Yellowstone National Park.
221 Typical stagecoach horses on way to Mt. Hood.
229 Hauling sight-seers in Yosemite Valley.
201 Taking sight-seers through Garden of Gods, Colorado.
209 Light driving horse, Arizona.
312 Carriage horses, Montevideo, Uruguay.
320 Two wheeled gig, Argentina, South America.
39 Hansom, best type of two wheeled gig, London.
383 Cab drivers, Berlin, Germany.

(C) SADDLE HORSES

The proudest place of all for the horse is as a saddle beast. Fashions may change, breeds may come and go, or other means of traction win a place; but the saddle horse is always in fashion.

The best saddle horses are of Arabian blood and there is some reason for believing that these are of a different wild stock from the heavy draft horse. The readiness of man to accept the horse is shown in the history of our own Indians. Two hundred years ago they had no horses, and within fifty years of getting them, they so gloried in their steeds that they pretended the horse had always been among them and was a special gift of the Great Spirit in the beginning.

The cowboy is the heir to the Indian range, and the pony is as essential to him as the steed to the Arab or the reindeer to the Lapp.

473 Thoroughbred Arabian horses in foreground.
494 A sheik and his faithful Arab steed, Syria.
193 Government officer on saddle horse, Yellowstone Park.
385 Band of famous cuirassier guards, Berlin, Germany.
464 Hungarian officer, Andrassy Strasse, Budapest.
585 Mounted British officers reviewing troops, Sydney.
333 South American farmers inspecting work on ranch.
182, 204 Indians on horseback.
188 Cowboys roping their mounts in corral, Montana.
127, 186 Cowboys riding on the range.

II. MULES AND DONKEYS

(A) MULES

There is an increase of mules as we enter the hotter regions of agriculture. Experience shows the mule to be tougher than the horse in a southern climate and much less easily prostrated by heat — no doubt because its other ancestor, the donkey, is a native of the hot tropical deserts of the East.

175 Mule team in Mo.; 124 Texas; 249 Panama; 294 Cent. America; 311 Brazil; 438 Spain; 479 Greece.

(B) DONKEYS

The patient, plodding, sturdy, sand-loving, water-hating donkey is seen in his native best in the following group. (Animals like these are also called asses and sometimes burros.)

574 Donkeys in pasture; 378, 522 as draft animal; 566, 567, 557 as saddle animal; 560, 524, 341 as pack animal.

III. CATTLE

BEEF, DAIRY AND DRAFT

A thousand years ago, there existed in Europe the kind of wild cattle known as urus or wild ox. These are represented today, first by the herd of wild cattle preserved in Chillingham Park, second by the domestic breeds found now in every quarter of the globe. There can be no question that all of our different common strains are descendants from the wild ox of Cæsar's time; though there are reasons for believing that to a slight extent one or two other breeds have been mixed in with it.

The habits of the Chillingham cattle — as I know to my discomfort, for once there they put me in peril of my life — are precisely like those of the wild cattle of Texas, their blood kin.

Owing to selective breeding, these wild cattle of Chillingham are now white with red ears and red knees. Yet we often see this combination on the plains of Texas. On the other hand, we often see a dun or brown Texan with black muzzle or legs and whitish under parts. This probably was the color of the original wild bull that the classic author describes as such a formidable monster.

(A) Beef Cattle

Wherever the white man has established himself, he has taken with him the horse, the cow, the dog, the cat, the hen, the rat, the mouse and the measles; and by much experiment and selective breeding, has in each new climate produced a breed of cattle fitted to the new environment.

There are three distinct kinds of service that the ox kind can render to man. First, as a range animal for beef and hides; second, as a dairy animal, producing chiefly milk and butter; third, as a draft animal.

370 Aberdeen Angus; 317 Shorthorns; 358, 589, 127, 185 Herefords; 186 Range cattle (mixed); 301 Spanish cattle; 140 Stock market, Chicago.

(B) Dairy Cattle

There are many breeds claiming notice among the dairy kinds, from the Holstein, yielding 20 to 30 quarts of thin milk per day, to the Jersey, whose 8 or 10 quarts per day is as rich as cream, in some cases, has

produced 3 lbs. of butter per day. A combination of the two qualities is reached in some measure by the famous Ayrshire cow from the land of Bobbie Burns.

159, 165, 57, 403 Holstein-Fresian; 364 Jersey; 371 Ayrshire; 356 Dairy shorthorn; 591 Mixed.

(C) Draft Cattle

There are certain great advantages in using cattle as draft animals; for example, their strength, their fearlessness in soft ground, their simplicity of diet, and the possibility of their being a food supply when too old for work, etc., to all of which the chief disadvantageous offset is their slowness.

Common Ox

580 Oxen in S. Africa; 298 Cuba; 284 Mexico; 561 Egypt; 337 S. America; 497 Palestine; 454 Ox and horse, Italy.

Buffalo

549 Philippines; 491 Syria; 474 Constantinople.

Humped Cattle of Asia

562 Egypt; 545 Java; 548 Philippines; 510 Burma.

IV. BISON AND BUFFALO

If we follow the classification of Lydekker, the living cattle kind may be divided into four groups; namely,

The Common Ox Kind or Round-Horned Cattle, discussed in the previous chapter.

Gaurs, Flat-Horned or Jungle Cattle, found in tropical Asia.

Bisons, or Woolly Round-Horned Cattle, including the American Buffalo and its European cousin the Bison or Aurochs.

Buffaloes Proper, with rough angular horns and nearly naked skin.

The famous American bison (commonly called buffalo) has never been successfully tamed. Its temper is always morose and the creature is subject to sudden fits of murderous rage. This is therefore one of the few in the cattle family that decline to become servants of man; we may kill him, but not enslave him.

232 Famous American bison, almost extinct.
549 Buffalo harrowing rice fields near Manila.
491 Shoeing a buffalo in a street of Tarsus, Syria.
474 European buffalo in yoke, Constantinople.

V. SHEEP AND GOATS

They have divided hoofs and chew a cud as oxen and cows do. There is little doubt that the dog was the first wild animal to be domesticated by man; but it seems likely that sheep came soon after, and as early as the days of Abel, the flocks of sheep were established as

a form of wealth. We can trace with certainty the origin of all our other domestic animals except the dog, the sheep and the goat. The sheep especially has been puzzling, for it has been so long in our folds and has been so completely modified by selective breeding that it no longer resembles any wild sheep that we know of.

A. SHEEP

When we examine the bighorn sheep of America, or its larger kinsman the bighorn of Europe, we find, as in most animals, a fine wool next the skin, but quite hidden by the long coarse bristles. It is believed that ages of selective breeding have worked out the bristles and developed the under wool until it is as we see it in our finest long woolled sheep today.

190,480 Merino; 173 Shropshire, Oxford and Cotswold.

B. GOATS

When Americans learn a little better the lessons of thrift in daily life, they may adopt the goat as the poor man's cow. Such is the solution that many a family in Norway, Switzerland and other European countries has adopted. For the goat is easily managed and fed. Its milk is especially acceptable for infants, and it is doubtful if any of our animals yield as high a percentage of profit as the lively goat, so valued abroad and so little understood with us.

411 Milking goats, Norway; 447 Goats, Switzerland.

VI. CAMELS AND LLAMA

Although there are no camels in North America, it is generally conceded now that the camel family originated on our continent and that a division took place so that the original home near California was broken up. One branch emigrated to Asia to father the humped camels of today, while the other went south to South America, where they are now represented by the tame llama, the tame alpaca, the wild guanaco and the wild vicuña.

The branch that went to Asia originally inhabited the high, bleak, cold steppes of Central Asia; where, according to Prejevalsky, the wild race still survives.

There are two well marked species of camel; first, the one-humped, well known in Arabia, which some believe to be its native land. When bred for speed, this one-humped camel is the "dromedary" which is credited with traveling ten miles an hour and covering one hundred miles a day.

The other species of camel is the Bactrian, or woolly camel of Central Asia. On account of its double hump it is called the two-humped camel, or, as described by a sailor, it is the "two masted ship of the desert." Of course, the masts are not masts at all, but magazines. The camel stores up fat in his hump when living is good and lives on his accumulated capital when food is scarce, also, by

means of a storage plant in his stomach, he can continue for several days without drinking.

The llama was the only domesticated hoofed animal in America before the white man came. It served as wool bearer and burden bearer, as well as for meat. In our zoölogical gardens it is noted for its readiness to spit in the face of any who annoy it.

564, 565 Camels in Egypt; 504 Caravan, Jaipur, India.
335 A llama near Lake Titicaca in Bolivia.

VII. DEER

Deer are like cattle, sheep and camels, cud-chewing animals with divided hoofs. Their horns (antlers) are shed and renewed annually. There are numerous species and in many places they are an important source of food for man and the larger carnivorous animals. The flesh of the deer is called venison. The reindeer is an indispensable domestic animal in some northern regions. Some deer as the moose and elk attain a large size, others may not exceed 18 inches in height. The magnificent specimen of American elk shown in 189 is truly wild and was secured by careful stalking with the camera. The name of the photographer is not given but it should have honorable mention.

413 Reindeer herd, Lapland; 2 Moose; 189 Elk.

VIII. DOG

The dog is a carnivorous animal of the family Canidae, kept in a domesticated state by man since prehistoric times until it has become the most intelligent of beasts. It is undoubtedly a modified descendant of the wild species of the genus Canis among which are the common wolf and jackal.

The dog has figured as man's companion in three wholly different rôles; first, as an aid in the chase. This was his earliest and his highest modern use. His second job was as a beast of burden, a draft animal, and his last as companion and watchman and guardian of his flocks.

118 Arkansas hounds.
279 Eskimo dog team, Hopedale, Labrador.
246 Gold miners and dog team, Alaska.
396 Dog drawing milk cart, Antwerp, Belgium.
190, 480 Shepherd dogs with the flocks.
204, 263 Faithful guardian of American Indians.
395, 490 Dog, companion to man in all walks of life.
529 The pet dog of a Japanese rice farmer.

IX. HOGS

When I was a small boy, I reasoned out for myself that a pig and an elephant must be cousins. For the pig is naked or bristly and thick-

skinned; he has hoofs, he grows tusks and the end of his snout is muscular, sensitive and movable. Yes, he is surely a pachyderm; and when I found that he really was in a large sense so classed, I felt proud and happy.

But our views illustrate the hog not as a zoölogical exhibit, but one of the most important food products of the United States. There is not the least doubt that the wise men who forbade Jew and Turk to eat pork did it knowing that thereby they would save these people from much dreadful disease.

But we live in a different time. Sanitation is better understood now. Modern methods of cookery put the terrible trichinæ beyond the possibility of harm; and we believe that robbed of pork America would today take a distinct backward economic step and gain nothing hygienic or ethical to offset the damage.

172 Hogs in rape pasture, Ames, Iowa.
183 Poland China hogs in alfalfa pasture, Kansas.
122 Hogs shifting for themselves, Texas.

X. HIPPOPOTAMI

If we call them "river horses," the naturalists chide us for our loose and incorrect nomenclature; but turn "river horse" into its exact Greek equivalent "Hippopotamus" and our scientific discrimination is applauded.

Next to the elephant the hippopotamus is the bulkiest existing quadruped. It is allied to the hog. It was formerly found in the rivers of most parts of Africa and is still quite common in the more remote districts. It is largely aquatic in its habits and can swim well and float and remain a long time under water. It feeds chiefly on aquatic plants but is sometimes destructive to cultivated crops.

577 Hippopotamus hunt, Rhodesia, Africa.
578 Returning with trophies from hippopotamus hunt.

XI. ELEPHANTS

There are two well known kinds of elephant; one the Indian, with the small ears and four toes on the hind foot; the other the bigger African elephant, with enormous ears and only three toes behind (both have five in front). Only the male Indian elephant has tusks while both male and female of the African elephant have these weapons.

It is well to remember that we once had native elephants of our own in America. The mastodon was undoubtedly hunted by our Indian predecessors, and its remains are found in many parts of the United States and Canada.

509 Elephants hauling teak logs, Burma.
505 Stately elephants on parade, Jaipur, India.

XII. ALLIGATORS

The alligator is a cold-blooded reptile of the crocodile family. It lives in tropical and sub-tropical countries. There was a time when the alligator was very abundant in all Florida rivers, but the discovery that its hide made a strong, durable and highly ornamental leather created such a demand that it is quite possible the alligator may go the way of the buffalo.

110 Alligator, Palm Beach, Florida.

XIII. BEAVERS

The beaver is an amphibious rodent. It has webbed hind feet and a broad flat tail. It shows great ingenuity in constructing its home and in building dams across streams. The beaver dam shown in view 196 is a quarter of a mile long and is wriggled across to take advantage of every bump, root and supply of building material. It was the pursuit of the beaver that first opened up the great North-west. Thousands of pelts were used for fur and thousands also for felt. In the latter case, the skins left over were used as leather.

196 A beaver dam, Yellowstone National Park.

XIV. KANGAROOS

The kangaroo, the creature that walks on three legs (counting his tail) and carries its young in its pocket, was enormously abundant in Australia at one time and furnished one of the finest kinds of leather. It is quite possible that the high quality of this leather may operate to save the jumper from extinction.

588 Kangaroos, Adelaide, Australia.

XV. SILK WORMS

China was the original home of the silk industry, and so fully did they appreciate it as a source of wealth that every effort was made by these astute silk farmers to keep it to themselves. But the secret arts of the silk culture were learned by two Persian monks, who went to China to confer the blessings of their message and incidentally derive such benefits as they could in fair exchange.

Having learned the methods of raising and reeling the silk, they returned to Constantinople, bringing with them a hollow cane in which was a quantity of silk worm eggs. This was in 552 A.D., under the Emperor Justinian, who did not a little towards giving this industry to the world at large.

Several attempts have been made to introduce silk culture into America; but so far it has not succeeded. Nor is it likely to succeed as long as the much larger opportunities of land, lumber, cattle and mineral exploitation are open to our thrifty population. For additional

information on silk manufacture see description on views 541, 22, 23, 24, 53, 54, 55.

536 Silk worm incubator, Japan.
537 Gathering mulberry leaves for the silk worms.
538 Feeding mulberry leaves to voracious young silk worms.
539 Silk worm cocoons in their nests.
540 Reeling silk from cocoons.

XVI. THE HARVEST OF THE SEA

Fishing has always been carried on in all maritime countries and has added greatly to their prosperity. Of all fish that are important to mankind, the West Coast Salmon has perhaps the strangest history. It is hatched far up in the head waters of the West Coast rivers and works down to the sea. After three or four years, it returns a full grown salmon, goes up the river to some small stream, there spawns and dies. "All die after spawning once"; so that the enormous catch of the canneries will have no effect on the salmon's number, if enough are left to stock the spawning beds. Jordan and Evermann say that the Pacific salmon "is unquestionably the most valuable fish in the world."

The importance of fisheries, in the food supplies of nations and as affording large returns for labor can scarcely be overestimated. The sea harvest is ripened without trouble or expense to the fishermen.

226 Netting salmon in the Columbia River, Oregon.
227 Butchering salmon in cannery, Astoria, Oregon.
244 Indians drying salmon on Yukon River, Alaska.
13 Drying codfish in the sun, Gloucester, Mass.
531 Drying sardines on beach, Beppu, Japan.
97 Bedding for young oysters, Hampton, Va.
86 "Shucking" oysters, Baltimore, Md.
481 Fisher women selling herring, Finland market.
345 Hunting seals on skis, South Polar Pack.
415 Whales and floating whale station, Spitzenbergen.

XVII. SOME STRANGE AND USEFUL BIRDS

584 The *Penguins* are flightless sea-birds of the southern hemisphere. They have bartered their freedom of the air for a fuller freedom in the water; for their powers of swimming and diving are so wonderful that they live on fish taken in open chase.

583 The *Gannets* in this view are a wonderful illustration of birds congregating in some favorite nesting ground well protected and near abundant food. There are said to be millions of these blacktailed gannets on this South African Island. The gannet has retained its mastery of the air combined with enough adaptation to the water to insure its securing fish for itself and its family.

239 *Ostriches.* Opposite the Gannet Island is the mainland of Africa, the home of the ostrich, the largest bird alive on earth today. Like the penguin, it has given up its hope of flight for some other advantages, in this case, great strength and bulk. This view was taken on a California ostrich farm, but the home of the industry is Africa.

240 *Pigeons.* Still more completely domesticated are the pigeons on the California pigeon farm. The number of white pigeons in this view catch the eye. The reason is simple; this is a squab farm. White squabs being clean and white looking, fetch a better price in the market, so that the squab farmer eliminates all dark strains as soon as possible.

56 *Chickens.* A similar idea may have to do with the white plumage of the Leghorns in this view; though in this case the eggs are the most profitable product of the live stock.

401 *Ducks.* In the Dutch village here shown whose mainstay is fishing, we have in the foreground a side issue of the thrifty fisheries, the ducks that careful breeding has brought to such perfection and made so profitable.

216 *Geese.* Their kinsfolk, are seen in this Puget Sound picture. Here again in the background is the big industry of the country, but in the foreground a side line of feathers. These common geese are now seen throughout the new West, showing that thrift and all-round development have slowly become the order of the day.

415 *Gulls.* And now, going farther from the land, we have a scene that is of regular occurrence at the cutting up of a whale. Not less than a dozen species of sea-birds and as many thousands of individuals are here assembled, a sight to gladden the heart of the bird lover as well as of the artist.

535 *White Cranes.* This view shows one of the charming scenes typical of Japan, with the little brown ladies in the foreground and the big white cranes in the background. One cannot help hoping that the overpowering influence of the white man's ways will not wipe out these pretty scenes and end by putting all Japan in Bowery boots and overalls.

359 *Nightingale.* It is fitting to close this bird chapter with one of the shyest. rarest, plainest and most famous of all birds. The one whose wonderful song has inspired poets and singers in all ages, the sweet nightingale, plain brown in her lowly nest, brooding over her plain brown eggs, in which there lies concealed "the music of the moon."

29. OUTDOOR LIFE

BOY SCOUTS, CAMP-FIRE GIRLS, WOODCRAFT LEAGUE

By DANIEL CARTER BEARD ("DAN BEARD")

HONORARY VICE-PRESIDENT AND NATIONAL SCOUT COMMISSIONER, BOY SCOUTS OF AMERICA, FLUSHING, N. Y.

Long before there were any skyscrapers, cottages, log houses, "shacks, shanties, or shelters," people lived on this earth, and they lived in the open! Our ancestors away back there were naked savages, but somewhere hidden in the simple brains of these people were the seeds that have since grown into wonderful minds, producing great statesmen, poets, artists and scientists.

But the people in those early days had something just as valuable as culture — and that is vigorous health. Mainly because of the large amount of work done indoors, the people of today do not have the vigorous health of the primitive men and women.

The modern trend or desire for the open has produced the Sons of Daniel Boone, the Boy Pioneers, from which sprang the Boy Scouts of America, the Girl Pioneers, Girl Scouts, the Summer Camps, the Camp-fire Girls and the Woodcraft League. The primary object is to send the people back again to the open, so that they may in a measure regain some of the rugged health and the normal healthy condition of the five senses possessed by their primitive savage ancestors.

It is acknowledged that the possession of vigorous health, clear farseeing eyes, acute ears and a delicate sense of smell is in no wise inconsistent with a highly developed intellect. Now the boys and girls of today have the young brains of modern men and women which only need schooling and education to make as good minds as any possessed by the great people of our history.

Here at school, by the aid of the Keystone stereographs, and lantern slides, we can in our minds take hikes anywhere on the face of the globe! We can pretend to pack our knapsacks, strap them on our shoulders, grasp our staff and *hit the trail*

back through history. We can spend a day at the pyramids, we can hobnob with the Sphinx, we can make a scout camp in the old Colosseum, or we can tramp among the cave dwellers of America and Europe. What fun! I envy you young people the joy of your study.

Think of sitting by your camp fire cooking flapjacks in the cliff dwellers' house, built in a cleft of a beetling precipice, or rolling up in your blanket and going to sleep where Julius Cæsar slept or where the ancient Greeks fought and worked.

We can do all this by help of these wonderful stereographs; we can visit Palestine and tramp through the Bible land where the Apostles lived and worked, where Christ preached and performed miracles. We can even take hikes to the places where the crosses were set and awe-stricken, with bared heads, stand on the ground where Christ was crucified!

Imagination is a wonderful thing, and fortunately young people have more of this gift than their seniors, so fill your ditty-bag full of enthusiasm and imagination and pack your knapsack with the facts and scenes found in this wonderful series and then start on your hike, anywhere you choose to go. We can scale the Matterhorn or climb the Himalayas and step out on the roof of the world. We can go to South Africa and see millions of gannets and whole regiments of funny penquins waddling about like white-vested soldiers. We can sail with Peary to the North Pole or travel with Amundson across antarctic lands.

There is nothing we cannot do on this earth if our ditty-bag is well filled and we have the help of a stereoscope or lantern and this wonderful collection of Keystone Views.

HIKES

1, 2 Some hunters hike through Maine woods.
6, to 10, 13 Visitors to Boston take hikes to historical places in and about the city.
14, to 18 A hike through the textile mills of Lawrence, Mass.
25, to 31, 34, 35, 51 The high school pupils take hikes about New York City.
36, to 39 Boy scouts, having read Irving's stories, take hikes in the Hudson River Valley.
47, to 50. Buffalo Camp-fire girls hike to Niagara Falls.
61, to 67 A hike to a steel mill at night is an experience never to be forgotten.

69, 70 Boy Scouts of Oil City hike out into the country to see a well shot.
73 Old soldiers hike over the Gettysburg battle fields.
74, to 79 A hike to a coal mine is very interesting.
80, 82, to 84 The Boy Scouts of Germantown hiked to Philadelphia to see the old bell and mint. They visited several factories while there.
87, to 96 Every American hopes some day to hike over Washington, D. C.
98, to 100. Also every American looks forward to hiking about the historic places near the mouth of the James River.
102, 103 Winter visitors to the Carolina mountains enjoy, and gain health from the mountain hikes.
108, to 111 A winter hike in Florida is well worth while.
106 Sherman's march to the sea was a famous hike.
119, 120 Hikes about New Orleans are interesting.
122, to 127 A hike through Texas shows the astonishing development of that country.
136, to 138 A party of Boy Scouts saw these scenes on a Saturday morning hike.
139, to 144 Very many visitors to Chicago hike through stockyards and packing houses.
150, to 152 Men are always interested in hikes to the factories where automobiles are made.
154, to 157 Michigan Boy Scouts hiked to the Lake Superior mines.
159, to 161 A morning hike along country roads will show scenes like this.
170, 171 Keokuk Scouts hike to the Great Dam.
174, 148 A hike along the river front at St. Louis, Mo., will show how the river must be watched.
191, to 197 The best way to see the Yellowstone is to hike through, camping each night. Professional guides help to make such an experience delightful.
202, 205, 207, 208 A canyon gives its full beauty to the pedestrian who hikes along the winding paths.
206, to 208 No matter what means of conveyance is used to reach these places, the sight-seer must hike over the steep trails if he is to see the best of it.
213, 214 Through such country, over mountains and valleys, hiked the gold hunters prospecting for gold.
219, 221 Enthusiastic mountain climbers hike to the tops of these mountains. They claim no exhilaration equals that obtained by mountain climbing.
228, 229 John Muir hiked through the Yosemite and made it known to the rest of us. Great naturalists must be great hikers.
228, to 242 A winter's hike through California is very entertaining.

182, 189, 191, to 197, 221, to 223 Through this country Lewis and Clark made that long, long hike, exploring the Louisiana Territory which the United States had just purchased.

243, to 246 All the people who travel in Alaska hike. Miners, merchants, officials all go on foot.

262, 264, to 269 Every year visitors from the States take the trip down the St. Lawrence, stopping to hike through and around Quebec, Montreal and other interesting places.

274, to 276 In the same way travelers in the Canadian Pacific take hikes through the lovely mountain scenery.

280, to 283 From Vera Cruz, one may hike to Mexico City over a broad highway built by the Aztecs. Cortez and his men walked this road.

284, to 289 Take a hike through Mexico with Keystone Views. It is far safer than a real hike would be.

291, to 294 You will need "seven league boots," that is Keystone Views, for this hike through Central America.

305, to 311. A hike about Rio Janeiro and Sao Paulo will let you see where your coffee comes from.

324, 325, 326, 327 Boy travelers in Chili will hike from Valparaiso to Santiago and then to the rainless coast where nitre is gotten.

329, to 334 Imagine following the footsteps of Pizarro. The cruel conqueror would hardly know this country as it is today.

338, to 341 Just a little hike today. Caracas must get all its imports through La Guaira, the port on the low hot coast. Let us hike along and see both cities.

347, to 352 English people walk much more than Americans. A hike through London's famous places is a hike through history.

354, to 356 Every boy and girl will be glad to hike to Shakespeare's home and perhaps attend a play in Memorial Theater.

365, to 372 Take your hike with Rob Roy, and Bruce and Wallace and Roderick Dhu. Over this country Sir Walter Scott loved to hike.

374, to 382 And next a hike through Ireland with proper respect to the "wee folk," not forgetting to kiss the Blarney stone.

383, to 385 Boy Scouts must hike about Berlin. It is not a parade they would see now, but soldiers on their way to the terrible war.

388, to 394 So many people are looking back to the delightful time they spent hiking down the Rhine region, stopping everywhere to see the beautiful scenery and historic places.

396, to 397 If today you could hike from Antwerp to Namur, it would be a different Belgium you would see, for Belgium has been almost destroyed by the war.

399, to 403 A hike through quaint Dutch places will show us that Holland, too, is feeling the war.

421, to 426 Be an American aviator on leave. Hike about Paris, and then go back to duty at the front.

427, 428, 440, to 449 The only right way to see the Alps is to go on foot. So take your staff, put on your mountain shoes and hike up the mountain roads. Climb the Matterhorn and study the glaciers and spend your nights in the lovely little *pensions* along your way. Whole schools in Switzerland make hikes to historical places.

458, 459, 456, 457, 450, to 455 And when you have seen the Alps, hike down into Italy and Sicily. It will take a whole vacation to visit noted places in Milan and Venice, to hike on to Florence and Rome. You will want to climb Vesuvius.

460, to 466 Again the "seven leagued boots" to hike through Austria-Hungary. This hike leaves us in Serajevo where the war began.

467, to 471 It will take giant steps (only the Keystone Views can help us) to hike down the Danube, taking only a glimpse of each of the Balkan peoples. Watch out for bandits on your way.

472 to 474, 489 Take a hike about Constantinople and see if you can learn why it is the "key of the East."

475, to 479 All of you, boys and girls, will take this hike through Greece, and, as you go, imagination will bring back the ancient glory.

482, to 488 Every American boy and girl living under the Stars and Stripes will be interested in this newest republic. So let us get a passport at Petrograd, and hike to the old capital at Moscow and then to the great market at Nizhni Novgorod. Watch the oppressed Jews in Warsaw and then hike to Kief.

492, to 498 How your heart thrills as you take this hike over the same roads and stand in the same places where Jesus used to be. Perhaps you camp where Richard Cœur de Lion pitched his tent or where Saladan had his camp.

500 Here is another long hike. You must start in at Calcutta low and hot and come out on the roof of the world.

513, 514 A hike in Hong Kong will surprise you. This Chinese city belongs to the English. Its name is Victoria and the island upon which it is located is Hong Kong.

515, to 519 A hike in this region is much pleasanter than riding in a palanquin.

519 Through people like these, our soldiers marched to Pekin to rescue the western legations shut up in that city. With the Keystone Views you can hike over the same ground much more safely.

525, to 541 A hike in Japan would include a visit to Fuji-Yama. You would go in the tea fields with this gay little girl. You would

buy shoes in this quaint shoe store, and visit the little ladies in the tea garden.

546, to 553 On your hike through the Philippines you will see buffaloes used as work animals and you may eat fresh coconuts and watch the natives making rope.

558, to 569 Start in at Alexandria and hike to Cairo. You will lunch with the Sphinx, camp in the shadow of the Pyramids. You will feel as if you had stepped into the far past until your hike ends at the very modern irrigation dam at Assuan.

575, to 577 Imagine you are with Livingstone hiking through the jungle, discovering the Victoria Falls.

570, to 573 Or with these views hike with Stanley searching for Livingstone and visit the savages in their native homes.

579, to 584 In South Africa you will hike to the gold mines, cross the veldts, hunt for diamonds, then hiking south you will see the gannets and penguins and at Cape Town take the ship for home.

585, to 589 Boy Scouts in Sydney will hike to Victoria and Queensland.

593, to 600 And finally with these views you can hike to some observatory and see sun, moon, stars and a comet.

30. VOCATIONAL GUIDANCE

By MEYER BLOOMFIELD, B.A.

DIRECTOR OF THE VOCATION BUREAU, BOSTON, MASS.

The story of the occupations is the story of about everything the world holds to be of human interest. Every occupation is a lesson in history, geography, civics, arithmetic, English and drawing. To have pictures of the world's work before our eyes as we go through our school lessons each day is to dramatize these lessons for ourselves in a way our memories take joy in; and when such pictures are of the kind the Keystone collection offers, the children react to them as they do to nothing less than an actual visit to the industries themselves. Here are pictures in three dimensions, solid, deep, and delicate in light and shade. Every child's imagination will supply the motion. A film or reel of moving pictures puts a strain on the eyes of young folks, the speed of the picture is oftentimes a distraction. The Keystone pictures are the more satisfactory for the quiet and composure they invite. For the reasons just mentioned, then, the use of the set dealing with various industries and employments is the best possible introduction for children to the vital subject of choosing a life career. During their early teens they get countless impressions; in their adolescence they begin to test out these impressions in life-experience. A childhood start through such impressions and associations as the Keystone views afford may prove to be decisive in the future careers of many a boy and girl.

In studying the pictures the thought that is most helpful to bear in mind is that everything we use and enjoy is the result of our own or some one else's labor, and that to do one's work well means skill, thought, effort, and sacrifice.

These 600 stereographs and slides touch a very wide range of vocational activity. In the space available for this comment only a limited number can be dealt with. The resource-

ful teacher will find in the title list and the various classifications a great deal of material that will prove helpful in presenting this subject.

1. PRODUCTION

A. FOOD GIVERS

(1) The Farmer

Three out of ten of all the people in the United States are farmers. We owe the food we eat to the work of these country people; from the flour mills get their grain, the textile mills their wool and cotton, the packing houses their cattle. Our shoes, clothing, and bread owe their existence to the farmer. Agriculture or farming is the basic vocation, every other vocation rests upon it. To help nature produce the food we need is a wonderful thing to do. A farmer must know many useful things, and use his mind well, for whatever mistakes he makes may affect us all in our comforts and necessities. A good farmer is a scientist, engineer, and business man all in one. There are many interesting careers open to those who love the outdoor life, simple food, hard work, and the wonders of sky and field throughout the changing seasons.

Railroads, automobiles, the post office, the telephone and telegraph have brought to the farmer's doorstep many of the advantages of the crowded centers of population and have done away with the isolation of the country home. There are libraries, granges, clubs, and many kinds of social activities.

The farmer is independent. He is his own master. He eats the food he raises. He is the backbone of our country.

Farm work is a daily education. There is something new to learn every day. The United States Bureau of Agriculture and experiment stations are working on a thousand problems for him. See Food Products under classification Production and Manufacturing, also the Agricultural group.

(2) The Stockman

The stockman is a farmer who raises cattle, horses, mules, sheep or hogs for the market. His products are in great demand. The great range country which cattle and sheep require is west of the Mississippi. See classification on Animals.

(3) The Dairyman

Unlike the stockman, we find the dairy business near the great cities. New York is at the head in numbers of dairy cows. Selling milk and cream calls for a location within driving distance of many people, or near a railroad or trolley line. The work on a dairy farm is exacting, but pleasant to one who loves animals. Modern sanitary dairies and creameries are fine business establishments with many opportunities for ambition.

159, 165 Modern dairy barns; 57, 403 Milking scenes; 46 Filling milk bottles; 45 Washing butter; 356 Shorthorn dairy cattle; 364 Jerseys; 371 Ayrshires; 591 New Zealand dairy cattle; 339 Dairy cow, Venezuela.

(4) The Poultryman

Here is one of the great businesses of our country. The eggs and poultry of the United States are worth as much as the hay or the wheat crop — about seven hundred millions of dollars.

There are many lines of opportunity to the careful and intelligent poultryman. Commission trade, hotels, restaurants, ships, and selected homes are some of the markets. A small capital but much assiduity are needed for both a moderate or large success in this business.

56 Chickens; 401, 564 Ducks; 216 Geese; 240 Pigeons.

(5) Market Gardening

The back yard is often the foundation of a good market garden business. Potatoes, cabbages, onions, asparagus, tomatoes, cucumbers, and melons, carefully grown, neatly packed, and delivered in fresh condition, have started many a boy and girl on the way to independence. Go to your grocer some day and find out where he gets his vegetables and how much he pays for them. See classification Orchard, Garden and Wood lot, also Marketing and Market Centers.

B. MINING

This is work for good students interested in their physics, chemistry and mineralogy. Good health and constitution able to stand day and night work and periods of strain are needed. Mining engineering is fascinating, at times full of adventure, then again come long periods of drudgery, poor food and little shelter.

Graduates of mining schools are in great demand. They earn little in the beginning, but if they are resourceful, industrious, and capable of carrying heavy responsibility, there is little to stop their advancement.

Mining work itself is arduous, often dangerous, and yet it is at the basis of all our industries.

74 to 79, 129 Coal; 187, 155 Copper; 581 Diamonds; 245, 225, 579 Gold; 3 Granite; 163, 164, 128 Iron; 4, 5 Marble; 325 Nitrate; 378 Peat; 122, 69, 70, 123 Petroleum; 115 Phosphate; 214, 287 Silver; 176 Zinc and Lead.

C. LUMBERING

To one who has taken a course in Forestry and is willing to start at the bottom and work up, the lumbering industry offers large opportunities. It calls for an intimate knowledge of trees. The work for the most part is heavy and out of doors, but pleasant to one who loves the open. For list of views see classification Wood Sources, etc.

is heavy, strength and skill are required. The great size e
ry makes many positions for a large office and sales force.
skilled workers are well paid and advancement is quite
its with technical training along lines of mechanical, elec
iemical engineering are much in demand. For views see M
sification Production and Manufacturing.

B. STRUCTURAL IRON AND STEEL WORKERS

is hard work, oftentimes dangerous, and calls for endu
eadiness.

task of this worker is to raise by means of engines the h
russes, girders, and beams, some weighing as much as tw
ach, put them in place, and rivet them fast in order to mak
on of a building or bridge.

Steel framework for tall building being erected.
, 28, 30 New York skyscrapers, the framework of which is
67, 121, 230 Tall buildings with steel framework.
74, 330, 366, 392, 27, 50, 500, 575 Bridges.
iffel Tower, tallest structure in world.
50, 334 Structural steel in mill and factory interiors.

C. AUTOMOBILE MANUFACTURE

is now one of the great industries of the country, for
e cars and trucks driven by gasoline or electricity are ar
essities of modern life and trade. In an automobile factor
ed designers, engineers, carriage makers, machinists, uphol
binet makers, painters, and many kinds of mechanics.

uilding up an automobile tire, Akron, O.
ssemblying room, Cadillac automobile plant, Detroit.
xperts testing Cadillac engines, Detroit.
nployees leaving Ford motor plant, Detroit.

E. THE MASON

The mason builds chimneys, walls, foundations, abutments, etc., by laying, according to plans, bricks, stones, and cement blocks, in orderly tiers with mortar between. He works in stone, concrete, cement, and plaster. A good mason is one who likes tools, science, mathematics, and drawing. Masons and carpenters are the backbone of the building trades and receive about the same pay, from $4 to $8 per day.

3 Quarrying granite; 4 Marble quarrying; 5 Chiseling marble; 25 to 30 Examples of masonry in New York City; 87 Capitol building; 95 Congressional Library; 139 Chicago buildings; 167 Minneapolis; 170 Keokuk dam; 210 Roosevelt dam; 230 San Francisco; 252, 253 Gatun locks; 348 London Bridge; 384 Royal Palace, Berlin; 424 Grand Opera, Paris; 425 Notre Dame, Paris; 429 Cathedral, Marseilles; 470 Cerna-Voda bridge; 483 The Kremlin, Moscow; 502 Taj Mahal. For further examples see classification Concrete, Stone, Brick and Tile.

F. THE ARCHITECT

The architect plans and designs buildings for the many purposes of shelter, comfort, work, recreation, and assembly. There are two sides to the work, one the artistic planning, the other the practical construction. Each side calls for much training and skill. While the earnings are seldom large, and this is true of most professional work, the satisfaction for those of artistic taste with a keen desire to draw, plan, and construct is considerable. Cathedral, palace, workshop, cottage — all owe their being to the dreams and the practical skill of these men. When you look at your city hall or dwelling, think of the long days of planning, sketching, figuring, then painstaking drawing of the smallest detail in the office of the architect. See Architectural Design under classification Industrial Design, including Architecture.

G. THE ELECTRICIAN

The electrical industry, like the automobile industry, is a recent and typically American development. American inventive geniuses, men like Edison and Westinghouse, have made it what it is. The practical electrician is a mechanic skilled in work of wiring houses, factories, and other buildings for electric lighting and electric power. Electrical engineers who are college trained men, well versed in science and mathematics, have charge of large constructions, such as power stations, electric railroads, mines, telephones and telegraphs.

There are many avenues to choose in this big field, open to those who like hard work, study, and the application of electrical energy to the many needs of domestic and industrial life.

31 Electric car lines, New York City.
43 Electric R. R. by side of steam road.
49, 50 Niagara Falls great source electric power.
139 Street car lines on State Street, Chicago.
170 Great power dam and locks in Mississippi River, Keokuk.

H. CHEMISTRY

s the manufacturing processes in this country become m
ive and complicated, the importance of chemistry becom
irent. It might be classed as one of our new industries bu
most important and one with an almost unlimited futur
and for skilled chemists greatly exceeds the supply.

Coke ovens. Coal tar is a by-product obtained in the m
ture of coke from coal. From it are obtained many ver
able chemicals. Formerly Germany manufactured most
coal tar dyes and chemicals. Now the United States g
ment is encouraging this very important industry.

INDUSTRIES THAT DEPEND UPON CHEMISTS

7, 156 Copper; 15, 16 Cotton; 134, 135 Glass; 287, 203 Gold; 6
; 84 Money; 325 Nitrate; 412, 19, 20 Paper; 122, 69, 70, 123
; 58, 59 Pottery; 131 Rubber; 53 to 55 Silk; 214, 334 Silve
67 Steel; 271, 258, 35, 34 Sugar; 272 Tanning; 107 Turp
1 Wool; 176 Zinc and lead.

3. DISTRIBUTION

A. RAILROADING

is is one of the most fascinating and important of all occup
he spirit of our new country is summed up in our improven
s of communication. Moving about speedily and easily
t of the growth of great civilization.
m the time when James Watt mused over his steaming te
s rattling lid to the present mogul engine and the electric l
the world has been growing into a neighbor

Great repair shops are maintained to keep the engines and cars in order.

The traffic department is charged with the duty of looking after the passenger and freight business, for a railroad must sell transportation if it is to have money. In this department we have also the mail and express service, as well as the station agents.

The accounting department with its corps of bookkeepers and clerks keeps track of the immense amount of papers, records, and accounts.

Railroad workers today are carrying a large responsibility and are required to be strong, of good habits, and most industrious. There are nearly two million men engaged in this work. See Railroad Transportation under classification Transportation.

B. MARKETING

Each year thousands of high school and business college graduates take positions as clerks and stenographers with firms that market food products, machinery, etc. Some of these positions offer large opportunities. A helpful study of marketing and market centers can be made with the "600 Set." See classification Marketing and Market Centers.

C. BANKING

A bank is not only a safe place in which to keep money and savings; it is the great means for giving credit or loans to those whose business requires funds or assurances that funds will be ready when necessary. In this way very little actual money passes. Bankers are advisers in matters of business, investments, loans, wills, and mortgages. A bank employs bookkeepers, clerks, messengers, and receiving and paying tellers. The cashier, treasurer, president are the highest officials. Work in a bank is congenial, and most of the time not very arduous, but the salaries paid are not very high except for the top officials, and promotions are slow. No one can get work in a bank who is not known for trustworthiness, neatness, good handwriting, and skill and accuracy in using figures.

29 Wall Street, now the world's financial center.
351 The Bank of England, London.
590 Union Bank of Australia, Hobart, Tasmania.

4. SPECIAL VOCATIONS

A. PRINTING

This work has to do with the manufacture of books, magazines, pamphlets, posters, and newspapers, and is one of the great industries of America. For neat, rapid, and well trained workers the field is unlimited, as the world calls each year for more and more printed matter of good quality.

28 *World* Building, New York, where one of our great newspapers is published.
94 Bureau of printing and engraving, Washington, D. C.

B. TEACHING

Our civilization is kept together by the work of the teacher, who trains the growing generation to take up the work of the world and carry it on with fresh energy and ideals and human sympathy. More than twenty million children are in our public schools, taught by more than half a million teachers.

The work is pleasant because it means helping children grow into fine men and women, but it is hard work, calling for strength, patience, constant study, and no end of sympathy.

As a rule teachers are never paid as well as highly skilled mechanics, but their services are valuable for the help they give and the love of their pupils, who are started well along in the life career.

A teacher must take a long course of training and be able to teach and to help in many ways. Education is a great science and means a lifetime of study and toil.

83 School gardens as a practical educational method.
260 Royal school, Honolulu, Hawaii.
306 American private school, Rio de Janeiro, Brazil.
465 Polish school children, Zakopane, Galicia.
520 American mission school, Pekin, China.

C. LIBRARIAN

This is a new profession and requires more ability than most people are aware of. There are several training schools preparing young men and women for this important work. To manage a library requires intelligence, business skill, literary taste and technical knowledge, as well as a personal interest in the needs of readers and the reading public.

95 Congressional Library, Washington, D. C.

D. CIVIL SERVICE

This is the channel by which men and women mainly reach the positions under our city, state, and national government. Our government is a great employer. In New York City alone over one hundred thousand men and women are city employees. Every kind of occupation is to be found in the Civil Service, which means that city, state, and nation need about the same kind of help that any private employer may need. So we find in the Civil Service positions for clerks, accountants, bookkeepers, court attendants, engineer, foreman, stenographer, draughtsman, librarian, and about all the trades. If you want to know what positions are open, and what you must do to prepare for an examination, write to the United States Civil Service Commission, Washington, D. C.

While the compensation is moderate, promotion slow, and opportunity limited, the work under the Civil Service is steady, and under good conditions.

8 Old State House, Boston. Many state officials are under the Civil Service.
28 New York City Halls, also many city employees.
32 Immigrants landing. Practically all of the employees of the United States government are under the Civil Service.
84 United States Government mint, Philadelphia.
87, 90, 94, 95 United States Government buildings, Washington, D. C.
99 Some operations of United States Life Saving corps.
100 United States warships in Hampton Roads.
193 Officers in our national park work under Civil Service.
260 School teachers in Hawaii and the Philippines work under the Civil Service.

DOMESTIC SCIENCE AND DOMESTIC ARTS

By MARTHA VAN RENSSELAER

PROFESSOR OF HOME ECONOMICS, AND DIRECTOR OF EXTENSION DEPT. OF HOME ECONOMICS, CORNELL UNIVERSITY, ITHACA, N. Y.

INTRODUCTION

Through a long period of evolution the family dwelling place had developed into a diversified manufacturing center where all the household arts and industries were carried out co-operatively under one roof by the women of the family. A girl growing up in that home gradually took her share in that labor and through constant observation and actual participation gained an intimate knowledge of the materials and the processes of manufacture of all the articles used in the home. She need not leave her own threshold to be thoroughly schooled in every branch of the domestic sciences and arts. Such training was passed on from mother to daughter. Varied as were the industries of these homes of two or three generations ago, the women presiding there had all the links in the chain of production within their own hands and did not need to investigate far beyond their own activities.

When the widespread introduction of machinery brought in its wake modern methods of coöperative business, the industries of the home were gradually taken over into factories — changing the home from a manufacturing plant to an administrative establishment where the housewife directs the purchase of equipment and commodities produced outside the home. For a time educators overlooked these changed conditions. Fortunately there came an awakening which resulted in the introduction of domestic science and art into our school system; and courses of study in home economics have been developed in our higher institutions of learning in order to train workers who are needed to teach in the public schools and to go among women whose advantages have been limited and to help in

every possible way to organize and standardize the difficult business of home-making.

The need for this knowledge has been impressed upon us by the great World War. The international food crisis showed that a woman's conserving work is of the greatest importance; that the expenditure and waste of the individual home are international problems. Consequently, the need for women to be specialized in their province of home-making has been enforced upon us and this resulted in starting an emergency program of education along the lines of proper home management. Such a program is basic to right living, and although started as a war measure, should be permanent. To this end, every means of education possible should be brought into play. It is not feasible to prepare women for intelligent direction of the highly organized modern home through lectures and textbooks only. Such knowledge has been too long confined to the laboratory and the technical school. It must be made common to *all* the people, that there may be a more intelligent selection and use of food, clothing and shelter since these relate to the well-being not of one, nor of one group, but of us all. The subject of Home Economics then, whether practiced for home making or for earning an independent living, becomes a profession, an opportunity for both men and women to place domestic life upon a rational business basis.

Where the girl formerly learned these things in her own home, she now needs to have them presented to her as vividly and impressively as possible. The stereograph and lantern slide series does just this. It shows all the materials of textiles used in the home and for clothing in their original forms, cotton growing in the fields, and ways in which it is gathered. It shows animals from which various fibers are obtained, how these fibers are woven into cloth, and it follows straight through to the marketing of the finished product. In the same way the subjects of household equipment, food, and home building are taken up and each step along the way is pictured. The Keystone Views make the world a practical laboratory and the world is none too large a laboratory for this important field of knowledge. They give such an exposition of processes and labor, that they tie education to living things and where it was theoretical they make it vital.

31. INDUSTRIES SUPPLYING THE HOME

By LORENZO DOW HARVEY, Ph.D.

PRESIDENT OF STOUT INSTITUTE, MENOMINEE, WIS.

Less than two hundred years ago, the ordinary home was an independent unit largely self-supporting. The men raised the food of all kinds; the clothes were entirely of home production. The houses were made of homemade boards or logs and even the nails were made at home.

In these days of specialized industry, the home has become composite, drawing its materials for work and comfort from every industry and from all over the world.

The Keystone Views show very clearly how every industry contributes to the home.

WOOD INDUSTRIES

In the United States most of our homes are made of wood. The inside finishing even in stone buildings is woodwork.

1 The forests of Maine furnish white pine.

162 A load of logs. Many kinds of hard woods were found in the American forests.

224 Felling a tree; 215 Chained log rafts; 216 Port Blakely mills. These three views show how trees are turned into lumber.

9, 10, 96, 181, 220 Most of the houses in the United States are made of lumber.

107 Houses are protected from the weather by paint which is mixed with turpentine.

88, 89, 92 The insides of the most beautiful buildings are finished in woodwork.

92, 373, 417 Most of the furniture is made of wood.

412 Some of our homes are decorated with wall paper made from wood pulp.

445 Many homes are heated by wood fires. An open wood fire, once so universal, is now a luxury.

MINING INDUSTRIES

Most of our homes seem far removed from mining and yet the products of that industry are in use every day. The Keystone Views will show this very clearly.

75, 76 Our houses and offices are heated by coal. If steam or hot water is used, it is heated by a coal fire.

78 Slate pickers take out the stone, leaving only the coal.

77, 129 Long strains carry the coal all over the United States.

68 Coke makes a very clean fire with an even heat, so is very much used.

378 In Ireland peat is the common fuel.

69, 70 In oil countries, oil and gas are used for fuel and light.

122, 123 As a result of refining petroleum, gasoline is obtained, also dyes for our clothing and medicines such as vaseline.

115 After fields have been cultivated, they become impoverished. Perhaps your own garden or fields have been fertilized with phosphates from this very mine.

155, 156, 157 Practically all the wires which carry electricity into your houses for light, for telephones or household use are copper.

187 Copper combined with brass is used in countless articles in our houses, from chandeliers to water faucets.

176 Zinc is used to cover other metals to prevent rusting. Galvanized ware is zinc covered. Zinc is also an important ingredient in brass.

214, 334 Silver is used in tableware, in photography, in jewelry and for coins.

214, 225, 287, 245 Gold fills our teeth, makes many pens and most of our watches and jewelry.

84 Both gold and silver are made into coins.

581 Besides their use as ornaments, diamonds are used where hard points are needed. The needle in some victrolas is diamond pointed.

METAL INDUSTRIES

62, 63, 64, 65, 66, 67 Try to count the places where iron or steel is used in your home. Begin with the blade of your knife, do not forget the watch springs, nor the beams in the steel framed buildings nor the nails in the heel of your shoe.

150, 151, 152 Even if you have no automobile of your own, your groceries, furniture, in fact whatever is delivered to you will probably come in some form of automobile.

TEXTILE INDUSTRY

It is a very good plan to let a child take some article of dress which he is wearing and trace it back through all the steps of its preparation for use. Such an exercise will show him very plainly how the home is affected by outside industry. It should develop the idea of interdependence and the responsibility of each worker in the sum of life.

Cotton

72 Crawford County, Pa. These little children are clothed in cotton dresses. The one immediately in the foreground is in a printed muslin bought at a store.

16 Lawrence, Mass. This cloth came from a printing room such as this.

15 Lawrence, Mass. Before the cloth could be printed, the design had to be made and transferred to the copper rolls.

14 Lawrence, Mass. The thread was spun before the cloth could be woven.

286 Mexico. Carding machines straightened the fibers before it could be spun.

119 New Orleans, La. The cotton came to the mills in the form of bales.

125 Texas. Gins had removed the seeds before the cotton could be baled.

124 Texas. Men with horses and wagons had carried it from the fields to the gin.

117 Mississippi. Negroes had picked it, and before that it had been planted and cared for.

72 Crawford County, Pa. So these little children playing so thoughtfully are dressed by the combined efforts of farmers, pickers, ginners, balers, carders, spinners, weavers, designers, printers, and merchants.

184 Kansas; 166 Minnesota. The starch used in preparing the cloth is made from corn or potatoes.

Silk

72 Crawford County, Pa.; 55 Paterson, N. J. The silk hair ribbons were perhaps woven in the factory at Paterson.

53 Paterson, N. J. For these hair ribbons men very carefully drew the warp.

23 Connecticut; 540, Japan. The threads used for this had been taken from the cocoon by machinery or else carefully reeled by some patient Japanese worker.

539 Japan. The cocoon had been spun by the silkworms.

538 Japan. These worms had been watched and fed.

537 Japan. Men went to the fields for the mulberry leaves which had been cultivated for that purpose.

536 Japan. Other workers had carefully watched the hatching of the silkworms.

Wool

In the same way, it takes a very great number of people and operations to make the woolen cloth you wear.

506 Kashmir, India. The shawls woven by these people are often worth their weight in gold.

81 Philadelphia. The woven cloth is always made of yarn which must be spun.

409 Norway. It must be cleaned and carded before spinning.

17 Before it can be carded, it must be sorted and cleaned.

146 Each sheep is sheared in the spring. The thick wool which kept the sheep warm in winter is cut off.

173 Iowa; 190, Idaho. To get the wool, sheep must be raised.

PAPER INDUSTRY

One of the great wastes of the nation is in the destruction of old cloth, the material from which the best paper is made. The more paper is made from rags, the less will it need to be made from wood pulp. The manufacture of paper from wood pulp is seriously depleting the forests.

19, 20 The rags in the first picture are the paper in the second.

412 Paper used in newspapers, wall paper, etc., is made from wood pulp.

FOODS

All industries which provide food — fisheries, agriculture, meat, dairying, poultry and salt industries — all these supply the home. The chapter on Foods and Cookery contains a clear presentation of these subjects.

TRANSPORTATION

In these days of specialized labor, people, especially those in the city, make very few things for themselves. All their food, clothes, building materials, everything is brought to them. So city people are absolutely dependent upon markets and transportation.

129 Conneaut, Ohio. The coal which heats your home must come by train.

123 Texas. If you use gas, it is transported by a pipe line.

119 Texas. Cotton raised in the South must be carried to the mills of the North or of England and the cloth is shipped to the users.

166 Potatoes; 167 Minneapolis; 139 Chicago. These Minnesota potatoes will probably feed Minneapolis or Chicago.

140 Chicago, Ill. Great trains bring the cattle to the stock yards.

141, to 145 Chicago, Ill. Other trains of refrigerator cars carry the meat to us.

For a complete treatment, see the chapter on Transportation.

MARKETS

7 Boston, Mass. Some of our buying, especially the purchase of fresh food, is done in local markets such as Quincy.

29 New York; 139 Chicago; 213, Ogden; 380, Dublin. Far more of our buying is done in stores which are really specialized markets. See Markets and Marketing.

32. FOODS AND COOKERY

By EDNA N. WHITE, B.S.

HEAD OF DEPT. OF HOME ECONOMICS AND SUPERVISOR OF HOME ECONOMICS EXTENSION DEPT. OHIO STATE UNIVERSITY, COLUMBUS, OHIO

Assisted by LENA McGUIRE, B.S.

ASSISTANT PROFESSOR OF HOME ECONOMICS, OHIO STATE UNIVERSITY, COLUMBUS, OHIO

The World War crisis has clearly shown the importance of knowledge of the food problem. Never have the services of people trained along these lines been in such demand; never has there been such an urgent call for the increase and conservation of our food supply.

Conservation means first of all prevention of waste. The one who selects the food must understand the use of the right kinds of food so that the body may make the very best use of the food eaten. For this reason people must learn what the body needs and what nutrients are in food materials, so that nothing will be wasted. Food is also wasted when it is spoiled in cooking, so those who handle the food in the home must learn how to prepare it. If food is not well seasoned or cooked, it is apt to be left on the table and so wasted. If it is carelessly handled and not kept clean, it spoils more quickly, so for this reason and because dirty foods carry disease, cleanliness is a necessity.

The next conservation problem is the saving of surplus food (the material that is not needed for immediate use). The methods usually employed are canning and drying, and so everywhere people are being taught how to can and dry.

Boys and girls may help in both ways to conserve food. Through their physiology they are taught what kinds of food to eat — they must remember to ask for what they can eat and no more — all food they take on their plates they must eat, so that none will be wasted. The boys and girls of our public schools can thousands of cans of fruit and vegetables every year. They form clubs to learn how and then collect their cans to sell.

I. FUEL

Fuel is necessary for the cooking of food.

1. Wood and Charcoal

Wood was doubtless the first fuel used for the preparation of food and even now in many regions it is still our most economical and most available fuel supply. See chapter on Wood.

2. Coal

It was a great day for the human race when the discovery was made that certain stones (coal) would burn. It is interesting to consider how much of our material civilization has depended upon the heat developed from the burning of coal. The mining of coal is one of our greatest industries.

129 A train load of coal with different sizes in separate cars, Conneaut, Ohio. This is the bituminous or soft coal. It burns freely but with considerable smoke and soot.

74 Stripping coal at Hazelton, Pa. The surface dirt is removed and great beds of coal, sometimes thirty, forty or more feet in depth are found. The coal in this region is the hard or anthracite coal. It burns with great heat but with little smoke.

76 Miner drilling and laborer loading black diamonds, Scranton, Pa. This shows clearly the bright, shiny character of the anthracite coal.

77 Car of anthracite coal on cage at bottom of shaft, Scranton, Pa.

79 Shipping anthracite coal, Ashley, Pa. Showing different sizes in the various cars. Anthracite coal is graded more carefully than soft or bituminous coal.

3. Coke

68 Coke is made from soft coal in something of the same way that charcoal is prepared from wood. It is a good fuel, giving a strong heat, without smoke.

4. Peat

378 Peat is a fuel made by the accumulation of plants in bogs or swamps. The bogs are drained, the peat is cut in layers and dried in the sun. It is then burned largely in open fireplaces such as are represented by scenes 113 and 372. It is a poor type of fuel.

5. Oil and Gas

69, 70, 122, 123 These are very useful fuels and are taken from the earth in great quantities. They usually occur at considerable depth, wells often being drilled from 3,000 to 7,000 feet deep. Oil and gas occur in about the same regions; so in drilling they cannot always tell which they will secure. Sometimes nothing is found after great expense has been incurred.

Natural gas usually is found having considerable pressure, so that it flows freely from the well and through the pipes to the place of consumption. When the pressure is not strong enough, pumps are used to force it through the pipes.

Oil as it comes from the well is known as crude petroleum. In this form it is not of much use for domestic fuel; but as fuel for the boilers of ocean steamships it is much in favor.

The products secured by refining crude petroleum are of considerable value as domestic fuels, the most valuable for this purpose being gasoline and kerosene. These, like natural gas, are especially desirable for summer cooking as they may be started quickly, give a good fire and may be extinguished when the cooking is completed.

II. FOODSTUFFS

No country in the world is so rich as America in the amount and variety of its foodstuffs. It furnishes by far the greater part of its own food and is able to export great quantities to other countries. It is true that the people of the United States, living in such plenty, have become very extravagant. With the opening of the World's War there came a nation-wide movement to study foods and to use them more economically.

1. Meat

The people in America depend largely on meat for the protein or muscle building foods. No other group of people, except perhaps the Esquimaux, eat so much flesh, and it is probable that in many cases more meat is used than is desirable. Meat furnishes fat and mineral elements as well as protein but contains practically no starch or sugar. For this reason, it is usually served with potatoes or some other food material high in starch.

183 Thrifty and contented hogs in rich alfalfa pasture, Kansas.

589 Range cattle, an important source of Australian wealth.

185 Feeding Hereford cattle, Manhattan, Kan. Henry Clay of Kentucky brought the first Herefords into America. They are a good beef cattle. Shorthorns are the heaviest of the beef breeds, and Herefords rank next in weight.

140 This is a view of cattle in the pens of the Union Stock Yards in Chicago, the meat packing center of the world. This plant was begun in 1865. It now covers 500 acres of ground.

141 The animals are taken from the pens and are marched single file into the slaughtering gangways. The various processes of bleeding, skinning and dressing take place in rapid order. Every process is inspected by a federal meat inspector. In this picture is shown the last process, the washing of the beef with boiling water.

142 Splitting backbones and final inspection of hogs before placing them in refrigerator rooms.

143 Trimming and skinning hams before pickling in preparation for market, Chicago, Ill.

144 Making link sausages with aid of machines which stuff ten feet per second.
145 Washing and tagging freshly killed lambs, Chicago, Ill.
56 Chicken meat is prized almost the world over.
216 Geese furnish very palatable meat.
240 Young pigeons or squabs are a delicacy especially suitable for invalids.

2. Milk

Milk is a remarkable food material because of the number of nutrients found — fat, protein, sugar, mineral and growth producing elements. It has a large proportion of water and is especially adapted to the child's needs. "A quart of milk per child per day" is a good rule. The care of milk is of great importance because it carries diseases such as typhoid, diphtheria, etc. The heating of milk at a low temperature known as pasteurization is required in most large cities at present to prevent the spread of contagious diseases through the milk.

159 Groups of modern dairy barns and herd of Holstein cattle, Wisconsin.
57 Milking scene in modern dairy, New Jersey.
45 Washing 1,000 pounds of freshly churned butter.
411 Milking the goats, Hardanger Fjord, Norway. A large part of the peasants of southern Europe also depend on goats' milk and some of the finest cheeses, such as Roquefort, are made from goats' milk.
413 Laplanders milking reindeer, Norway.
403 Dutch farm hands milking Holstein Friesian cattle near Rotterdam, Holland. The Holstein gives great quantities of milk. The Dutch have a great name as butter and cheese makers.

Various Means of Distributing Milk

339 Native method of distributing milk unadulterated in the narrow streets of La Guaira, Venezuela.
487 Quaint dairymaids delivering milk in earthenware jars suspended on poles in Kiev, Russia. If you want a drink of milk, you can be served instantly.
396 Milk cart, Antwerp, Belgium.
46 Automatic machine for filling and capping bottles of milk. Closed bottles such as these allow clean, pure milk to be delivered.

3. Oysters

In nutritive value, oysters resemble milk, having about the same proportion of water. The difference in price is paid for flavor and scarcity and not for food value. There is some danger of transmitting disease through oysters if they are grown in impure water or carelessly handled, so precautions must be taken to prevent contamination. If oysters are cooked too long or at too high a temperature they become tough and undesirable.

86 Oysters are caught by dragnets or by long racks. Shucking consists merely of removing the shells. This is done by a stroke

of a hammer or a knife. The shucked oysters then go to the packing room.

4. Fish

Fish is such a perishable type of food that much of it must be preserved before it is sent to market. The most common methods are canning and curing.

Salmon is one of the most valuable of the food fish and one of the most important fishery products. The great bulk of the catch is canned. Salmon is higher in food value than most fish, due to the amount of fat it contains.

Fish is cured by soaking in brine or packing in salt and then drying. In preparing it for the table it must first be soaked to remove some of the salt and then is usually cooked in water. Codfish contains protein but very little fat and should be served with some starchy food, such as potatoes. Fat is usually added in its preparation.

226 You are here shown the nets which are used for catching salmon.
227 In this picture the salmon are being prepared for canning. It shows the size of the salmon.
531 Fish are a large part of the diet of the Japanese people. It is preserved by drying.
13 Codfish sometimes grow to be as much as five feet in length. The fish are cleaned, salted and placed on platforms to dry.
244 Drying fish on the Yukon River, Alaska. Dried fish is a very important article of diet among primitive people in cold regions.

5. Eggs

The egg industry in the United States is of great importance, the amount of money involved being equal to from one-half to one-third the value of the wheat crop. They are one of our most important sources of food. They are rich in mineral salts, protein and the fat is of a type especially adapted to the needs of growing children. A dozen eggs may be considered as approximately equal to two pounds of meat, and for children and invalids are more desirable than meat.

56 Hens' nests should be kept clean. In this picture is shown the white leghorn in a laying house, Corning egg farm, New Jersey.
583 The eggs of gannets are eagerly sought in South Africa and in the lands bordering the far North Atlantic Ocean where they are also found.

6. Cereal Grains

Cereals furnish more nutrients for the great majority of people than any other type of food material. Some type is raised in all countries, so they are easily procured. They are high in nutritive value, have very little waste and keep well. They are not palatable when eaten raw and so are practically always cooked.

All of them contain starch in quantity as well as considerable fiber and so require long cooking. Wheat and rye contain a protein substance which will hold air and on heating sets and can, therefore, be used for making loaves of bread.

a. Wheat

Wheat is the most important member of the cereal group, since it is best adapted for bread making. The hard wheats produced in the Northwest are especially desirable for this purpose. Flour produced by primitive methods of grinding contain more of the mineral and growth producing elements than the white flour of our markets. It is darker in color and much coarser, so that the bread made from it is dark and coarse-grained.

Wheat contains starch, protein, mineral and growth promoting elements but is low in fat and water content.

177 After the wheat is cut and made into sheaves, it is taken to the threshing machine. Here the grain is separated out from the straw.

199 This wheat was raised in Colorado by the system called dry farming. One of the first requirements of dry farming is to select a soil that will absorb much rainfall and hold it.

218 In the Western States are great wheat fields and most of the work of gathering the crop is done by machinery. This picture shows the combined reaper and thresher.

357 The wheat in England is cut in similar way to that in the United States, and most of the machinery used has been made in the United States.

498 Wouldn't this be a slow method of preparing wheat for bread? Notice the heavy stones used to crush the grain.

b. Corn

Corn is a staple article of food in parts of Africa, United States, Italy and the Balkan regions. It is a wholesome and nutritious food, high in starch, low in fat and mineral salt and while it contains about ten per cent. protein, it is not of the type that will hold air and form a loaf as does wheat and rye. It also contains considerable fiber, so must be cooked for a long time. Since the fat and protein are rather low, it is desirable to combine corn preparations with meat or cheese or eggs, and add fat of some kind.

184 The United States produces five-sixths of the corn crop of the world.

136 By the use of machinery the corn is cut and made into shocks.

160 Sometimes the corn is not taken from the stalk but is cut up by machinery and placed in a silo for cattle feed in the winter.

c. Oats

The oats used for food in America are served in the form of porridge as breakfast food. In the milling less of outer layers are removed than in most grains, and the greater part of the germ is left, so that oats are somewhat richer in protein and fat than the ordinary cereal. Because of the starch and fiber they need long, slow cooking.

147 Oats will grow on soil that is not rich enough to produce some of the other cereal grains. The men here seen are gathering oats which have been cut with a binder. The grain will be threshed from the straw.

d. Rice

Rice is one of the staple cereal foods for about half the population of the earth. It contains large amounts of starch, very little fat and protein. For this reason it is frequently combined with meat, cheese and eggs, and fats of various kinds are added in the preparation of rice dishes.

As ordinarily sold, the rice is polished, and this process removes a large part of the valuable mineral salt. The so-called brown rice has not been subjected to this process and is, therefore, to be preferred as a food.

527 Rice is an important cereal. India produces one-half of the rice supply of the world. China produces one-fourth and Japan one-eighth. In this picture we can see the large fields. Growing rice looks like wheat or oats.

528 The Japanese farmers are busy setting out rice plants. They are set out in fields which have been flooded with water. In the United States the rice is sown by drills just as wheat is.

104 Rice is a water plant, so the fields must be irrigated.

105 The men and women are busy hoeing rice in a field in South Carolina.

529 In Japan the rice is cut by a sickle. Rice straw is used to make mats, bags and ropes.

550 Heavy mallets are used to thrash out the rice grains.

7. Legumes

The legume family, including beans, peas and peanuts, stands next to cereals in importance as foods. They are especially valued for their protein and should be used, therefore, as substitutes for meat, eggs, or cheese. They also contain considerable starch and mineral salt, but all except the peanut are low in fat. For this reason fat is commonly added in their preparation (viz. pork and beans). Because of the amount of fiber present they require long, slow cooking.

Peanuts are usually regarded as nuts and eaten as an accessory. They are very high in food value and eaten in quantity may prove indigestible on this account. They should be mixed with other food materials and served as a part of the meal.

562 In Egypt a very old method is used in threshing out the beans.

118 The peanuts grow in the ground like potatoes. The plants are pulled from the ground, dried and then the nuts are picked from the roots.

8. Nuts

Nuts contain large amounts of fat and protein and may, therefore, cause digestive disturbances if eaten in quantity as an accessory to the diet. They are also valued for their mineral matter and may well be used as a substitute for meat, cheese or eggs.

a. Almonds

234 Almond trees look like peach trees. The fruit from which we get the almonds is left to dry on the trees. Then the shriveled

fruit is taken off, the seed is removed and put into sacks or barrels.

b. Coconut

The coconut is most familiar to us as food in the grated and dried form, and is mostly used in pastry and confectionery. It is very high in fat and contains some starch. Sugar is frequently added to it in drying. It is a staple article of food for many of the natives in the tropics.

551 The coconut is covered with a thick husk which is removed before the nuts are shipped.

9. Potatoes

Potatoes belong to the class of starchy vegetables and are valued both for starch and mineral salt. They probably owe their popularity to their mild flavor which does not become tiresome, and is easily varied, and to the fact that they keep well and are usually rather low in price. A large part of the nutrients lie next to the outside layer and in careless paring may be lost. It is therefore desirable to cook them in their skins as far as possible.

166 Potato digging machines are used to dig the potatoes in Minnesota, which is a leading state in potato production.

10. Sugar

The term sugar is usually applied to the sweet substance obtained from the sugar cane or sugar beet. There are, however, a number of other varieties found in fruits, honey, etc. The product obtained from sugar cane, sugar beets and sugar maple is identical, providing it is refined to the same degree, and is sold usually under the name granulated sugar. It is one of the purest food products on the market — concentrated food which is easily assimilated by the body if not eaten in excess. Because of its concentration, it is desirable to mix it with other nutrients in the diet.

a. Process of Making Sugar from Beets

419 A large supply of the sugar in Europe is from the sugar beet. In this picture we see women weeding a field of sugar beets.

198 In this picture we see a field of sugar beets. Colorado has become the leading state in the production of beet sugar.

270 The sugar beets are white, large and very sweet. After the beets are gathered they are stored in sheds and there are carefully washed.

271 The beets are sliced and the juice extracted with water.

b. Process of Making Sugar from Cane

332 Here we see a field in Peru that is being prepared for the planting of sugar cane. The cane was brought into Peru by Spaniards.

333 In this picture we see the cane plant and the way it is planted.

258 When the sugar cane is ripe, it is cut in the same way as corn

but the leaves are pulled from the stalks. The juice is squeezed out when the stalks are run through large rollers.

35 The raw sugar is brown and moist and, by refining, the color is changed and the crystals become larger. Granulated sugar is about ninety-nine per cent. pure.

34 The loaf sugar is made by molding the granulated sugar. In this picture we see the large trays of loaf sugar after it has been dried out in the drying kiln.

130 In the northern part of the United States maple sugar is produced to some extent.

11. Green Vegetables

Green vegetables are valued in the diet especially for their mineral salt. They are largely made up of water and woody fiber and may contain small amounts of starch and sugar.

The types that can be eaten raw, such as celery, are especially desirable, since none of their mineral matter will be lost in preparation.

149 Harvesting celery blanched by boards in Michigan's famous celery fields, Kalamazoo, Mich.

83 Garden vegetables of all kinds are valuable food and large quantities can be raised on relatively little space.

12. Fruits

Fruits are especially valued in the diet because of their mineral salts. They also contain characteristic flavoring substances and organic acids which make them valuable as appetizers. Sugars of different types are found in most ripe fruits and a few, such as the banana, contain quantities of starch.

The water content is high except in the case of raisins, dates, figs and other dried fruits. When these are eaten as purchased and not cooked, they form a concentrated food material.

175 The apple is an important fruit. It contains sugar, starch, mineral matter and a large amount of water.

85 Peaches are regarded as among the most valuable of all orchard fruits for evaporating, preserving and canning.

236 In this picture we see the Tokay grape, which is grown abundantly in California. They are large and firm. Grapes are used for making raisins, grape juice and various wines. Raisins are grapes that have been carefully dried.

294 The banana is more like a vegetable because it contains a large amount of starch. The food value of a banana is high. In the countries where the fruit is grown, the natives usually cook the banana before eating it. Banana flour is used to some extent to make cakes and bread.

108 Pineapples are planted in fields of sand. The fruit gets its name because of its resemblance to the cone of a pine tree.

237 Oranges are valuable for their mineral salts and the juice is especially beneficial to young children.

238 In this picture we see the beautiful orange blossoms and the large fruit on the trees.

437 Care must be taken in picking the oranges so the skin is not bruised.

293 The mangoes are reddish yellow in color when ripe and are cultivated in the West Indies, Florida, California and Central America.

47 The cantaloupe was given its name in Italy where it was first grown in Europe. It has become a favorite fruit in this country.

137 The pumpkin is a member of the gourd family and is a valuable food. It may be successfully canned and used in the winter time.

13. Cocoa and Chocolate

Cacao beans are roasted, crushed, the germ and hulls removed, and then thoroughly ground, which reduces the mass to a thin paste. This paste when cool forms the cakes of unsweetened chocolate. This contains some starch and considerable fat, so the food value is high. Part of the fat may be removed by pressure and the residue finally powdered is known as cocoa. Since the fat content is here lowered, the food value is not so high as in the chocolate.

Both chocolate and cocoa may be combined with milk into beverages which are excellent for children.

303 It is from the fruit of the cacao trees that our commercial chocolate is made.

14. Coffee

The coffee beverage is made from the ground roasted coffee beans. It is nearly all water of course, but contains very small amounts of flavoring materials and a stimulating substance knows as caffeine. The coffee beverage has no food value except from the cream and sugar that may be added. Because of its stimulating effect on the nervous system, coffee should never be given to children.

302 In the wild state the coffee trees grow from 20 to 30 feet tall, but if the tree is trimmed back the berries are easier to pick. The berries are dark red and inside of the pulp is found the two half beans with flat sides together.

310 The berries are picked, pulp is mashed and seeds are washed in vats. The green wet coffee is spread on cement floors to dry.

311 After the berries are dried — it takes about two weeks — they are placed in sacks holding about 132 pounds.

295 Coffee is shipped dried but green. It is roasted usually in the country to which it is sent. Brazil grows about three-fourths of the world's coffee. Santos, Brazil, is the greatest coffee port in the world.

15. Salt

42 Most of our salt is made from brine obtained from wells. The brine is placed in large vats. The sun and air evaporate the

water and the salt is raked out. Salt is used to give flavor to food and is often used in too large amounts.

153 In this picture we see the refined salt being packed into barrels.

III. PREPARING AND SERVING FOOD

Quite as much food value depends upon the method of cooking and serving as upon the food itself. It is well known that food eaten quietly and pleasantly digests more easily than that eaten hastily or where the feeling was disagreeable. American homes are so supplied with materials prepared for cooking and means of serving that we sometimes fail to appreciate our advantages.

550 Pounding rice for breakfast. The menu of primitive people must be very limited for they cannot get foods prepared for cooking. These people, for instance, get their rice in the husk. Their cooking implements are of the crudest sort.

498 Women grinding wheat. Instead of the fine flour your mothers buy all ready for use, these women must begin their bread making with the grain. Their flour will not be white but it will contain all the nutritive value of the grain.

410 Making Norwegian flat bread. Can you imagine the thin hard bread of flour and water, baked two or three times a year instead of the light bread which comes fresh to your table several times a week? With so few materials to work with, housekeeping is very laborious.

292 Tortilla making. Cooking though primitive may be clean, as you can see. Here again the woman begins her work with the corn on the cob. Compare this kitchen with your own and tell where you think the better results can be obtained.

341 The city baker of Caracas is perhaps as clean as many of our own bakers. One wishes there were a law in Caracas as in many of our own cities to compel bakers to wrap their bread in paper before it is carried through the streets.

372 In Burns' home you see facilities for cooking vastly superior to those of the bread makers in Norway or Salvador. Notice the table and dishes for serving in this cottage.

373 A highland home. Tea is being served. Notice there is no attempt at a table cloth, the dishes are few and simple, yet the cleanliness and orderliness, and the evident good manners of the two old ladies, make the tea seem very appetizing.

468 Quite different are these tables with their embroidered cloths set out in the street where they will catch dirt and dust. It does not seem quite consistent to be eating and having your boots blacked at the same time.

33 Dining room. Not every one has beautiful furniture and china and silverware for a dining room; yet everyone can have a clean room and a well set table. Food really tastes better when daintily served and eaten in a well-bred manner.

59 Pretty dishes are so cheap now-a-days that very poor people may set attractive tables. Better designs in decoration are now used

in the cheaper wares. Dishes do not have to be expensive to be in good taste.

534 The Japanese people give ideal service. Notice how simple is this arrangement for serving tea, how quiet and cool. The blossoms of the trees furnish beauty.

152 One of these men carries a lunch box. Thousands of men (62 to 67, 134, 135) carry lunches every day. A lunch should be packed as carefully and daintily as a table is set. Each thing should be carefully wrapped in waxed paper so the tired worker can get all the possible refreshment from the clean, attractive food.

33. TEXTILES AND CLOTHING

By ANNA M. COOLEY, B.S.

ASSOCIATE PROFESSOR OF HOUSEHOLD ARTS EDUCATION, TEACHERS COLLEGE, COLUMBIA UNIVERSITY

Assisted by EDITH P. CHACE, B.S.

INSTRUCTOR IN HOUSEHOLD ARTS EDUCATION, TEACHERS COLLEGE, COLUMBIA UNIVERSITY

The teacher of clothing and textiles expecting to use the "600 Set" to advantage should have a comprehensive and accurate knowledge of the various subdivisions of the classification under the headings of Textiles and of Clothing. The teacher can then select quickly the best pictures to be used for any topic bearing on the particular field. She should notice also the classification of this part of the field of household arts (or home economics) in its relationship to the whole, to the home, its industries, its food and management. It is only through having a connected idea of the whole that the pictures of this group can be used most advantageously.

The stereographs as well as the lantern slides will be found of great help in teaching the origin and manufacture of materials, the uses of the various textiles, industrial occupations of the textile industry, and the costumes of various countries, both modern and historical. This means of instruction enables the children to obtain a complete visualization of the subjects which previously the teacher has only described or possibly at times illustrated with small pictures or other devices upon which she has been forced to rely and to secure through her own initiative. These helps are vital to the best instruction and pleasing to the children. The views in this set give a concrete idea of the fibers and materials used for various articles of clothing and the methods employed by the different races of the world in procuring, manufacturing and distributing them.

An interesting comparative study of the methods of different peoples along the lines of textile manufacture is, therefore, possible and highly desirable, for it leads to definiteness of thought in relation to the peoples of other nations and the

sources of many of our industrial supplies used in the making of clothing and other articles. If woman is to be an intelligent consumer of textile materials, she should know more about the source of those materials, their manufacture and means of distribution, and their relationship to the cost of living. An interesting study of the homes of other lands is developed in this comparative study of textile manufacture and of uses of clothing, and should be valuable to the children in giving them appreciation and ideals for the best type of home in a democracy, and complete understanding of the way in which the races of the world provide themselves with the necessities of life, clothing, shelter and food.

The slides and pictures can be used most advantageously in preparation for visits to museums or places of manufacture. The things to be seen should be well outlined by the class before the visit. The use of the slides makes this familiarity possible. The pupil because of this introductory study will gain more from the excursion.

In places where there are no museums or mills, these pictures are a positive necessity. The depth of the stereographic picture gives ideas of reality and action which can not be obtained from any flat picture however good. In such places the "600 Set" will be a real museum. And even where there are manufacturing plants, children as a rule do not go into them. They hear them discussed, but do not really know them. These pictures will make clear the children's hazy ideas and will bring them into a better understanding of the life about them.

I. Textiles

A. PRODUCTION

The principal textile fibers belong either to the vegetable or to the animal class. There are in addition the mineral fibers as asbestos and also certain artificial fibers which are vegetable, mineral or animal in origin.

1. VEGETABLE FIBERS

These are obtained from various parts of plants — the leaves, stem, seed pod, etc.

(1) Cotton

This is the soft covering attached to the seeds in the boll.

117 Picking cotton on a Mississippi plantation.
124 Awaiting their turn at the cotton gin.

(2) Hemp

The leaves and also the stem of these plants furnish this fiber.

a. Sisal

571 Sisal hemp plantation in blossom, Africa.
289 Hennequin, the wealth of Yucatan, from which sisal fiber is produced, Mexico.

b. Manila

552 Manila hemp industry. Stripping the trees, Philippines.

(3) Bark

The covering of trees and some fruits is used for making cloth.

570 Peeling bark for bark cloth, Uganda, Africa.

(4) Pina

108 Pina fiber comes from the leaves of the pineapple, Florida.

(5) Palm

The leaves of this plant are very useful for matting and coarse textiles.

566 Some Egyptian palm trees.
259 Papaya and palm trees, Hawaii.
249 A street in Panama showing palm trees.
551 Gathering coconuts, the fiber of which is used for mats and coarse textiles, Philippines.
574 An east African palm tree.

2. ANIMAL FIBERS

These are obtained from a great variety of animals.

(1) Silk

The tiny silkworm furnishes this fiber.

536 Silkworm incubator, Japan.
537 Gathering mulberry leaves for the silkworm, Japan.
538 Feeding mulberry leaves to the young silkworms.
539 Silkworm cocoons in their nest.

(2) Wool

Sheep of many varieties furnish wool.

173 Choice Shropshire, Oxford, and Cotswold sheep in pasture.
190 Sheep grazing on range, Idaho.
480 Shepherds and their flocks, Greece.

(3) Hair

The hair of many animals is used in the manufacture of textiles for clothing, house furnishing materials, bagging and other purposes.

(a) Horse

This hair is used with others in making a strong wiry cloth known as horse hair cloth.

138 Champion team of Percherons, Indiana.
147 Loading oats in field, Illinois.
188 Cowboy, bronco corral and camps, Montana.
398 Belgian draft horses, Belgium.

(b) Goats

Some goats have long silky hair and others wiry hair. The wiry hair is used in making such materials as alpaca, mohair and brilliantine. The softer goat hair furnishes us with cashmeres.

411 Milking the goats, Norway.
447 Swiss mountain goats.

(c) Cattle

The hair from cattle is mixed with other fibers and used in making coarse felts for roofing, covering steam pipes and boilers; it is also used for stuffing cushions and is woven into coarse blankets.

140 From the Kansas plains.
185 Splendid Hereford cattle.
317 Argentina's famous cattle.
186 Round up on Sherman ranch, Kansas.
339 In the narrow streets of La Guaira, Venezuela.

(d) Camel

Hair from the camel is used in the manufacture of some clothing and the coarser hairs for bagging and coarse yarns.

564 Camels at Nile.
565 Camel at Sphinx, Egypt.

(e) Llama

This animal helps to furnish us with strong lustrous fibers for dress goods.

335 The llama of Bolivia.

B. MANUFACTURING PROCESSES

In modern times very much of the work of manufacturing textiles is done in great factories where the labor is highly specialized. Hand labor still persists where labor is cheap and in isolated communities.

I. VEGETABLE FIBERS

The fibers from the plants must pass through many manufacturing processes before they are ready to be woven into cloth.

(1) COTTON

From the seed pod or cotton boll.

(a) Ginning

This process removes the seeds from the fiber.

124 Awaiting their turn at the cotton gin, Greenville, Tex.
125 Cotton gin, Greenville, Tex.

(b) Baling

Making into compact bales of about 500 lbs. for transportation.

119 Bales of cotton ready for shipping, New Orleans, La.

(c) Carding

This process removes dirt and prepares for the next step in manufacture.

286 Carding room, cotton mills, Mexico.

(d) Spinning

Drawing out and twisting fibers together to make a continuous yarn.

563 Native boys spinning cotton, Egypt.
14 Spinning cotton yarn, Lawrence, Mass.

(e) Printing

Decorating the material by means of a stamped design.

15 Copying designs on copper rolls for printing cotton cloth, Lawrence, Mass.
16 General view in large printing room of cotton mills, Lawrence, Mass.

(2) LINEN

This is obtained from the stem of the flax plant.

268 Winding bobbins in linen mill, Canada.
269 Weaving the linen fabric, Canada.

(3) OTHER VEGETABLE FIBERS

(a) Bark

570 Peeling bark for making bark cloth, Uganda, Africa.

(b) Hemp — Rope Making

553 Interior of native rope factory, Philippines.

2. ANIMAL FIBERS

Animal fibers must also be prepared and woven.

(1) SILK

This must be cleansed, twisted and woven.

(a) Spinning

The silk fiber may be taken from the cocoon in two ways. It may be reeled by hand as is done in Japan; or it may be made from "waste" by machinery, the method commonly used in America.

540 Reeling silk from cocoons, Japan.
22 Weighing and sorting raw skeins (reeled silk), S. Manchester, Conn.

23 First drawing or straightening of fibers (spun silk), S. Manchester, Conn.
24 Roving frame, in which the thread is made, S. Manchester, Conn.

(b) Weaving

Making the cloth.

53 Drawing warp for weaving silk cloth, Paterson, N. J.
54 Weaving room, Paterson, N. J.
55 Machines weaving dozens of fine taffeta silk ribbons, Paterson, N. J.
541 One of Japan's largest modern silk weaving plants.

(2) WOOL

(a) Sorting

Wool must be sorted and washed before it is spun.

17 Sorting wool after cleansing and washing, Lawrence, Mass.

(b) Carding and Spinning

Straightening the fibers and twisting them into thread.

409 Carding and spinning wool, Norway.
506 Spinning and weaving shawls, Kashmir, India.
81 Spinning room, winding bobbins with woolen yarn for weaving, Philadelphia.

(c) Weaving — Making Cloth

The hand made shawls and carpets of the orientals are often wonderfully beautiful.

506 Spinning and weaving woolen shawls, Kashmir, India.

(3) HAIR

272 Scraping hair from hides.

C. USES OF TEXTILES

Textiles are used for many purposes besides clothing.

1. FOR CLOTHING THE PEOPLES OF MANY COUNTRIES

See II. Clothing.

2. FOR THE HOME IN ITS FURNISHINGS

33 Domestic art dining room (table doilies, curtains, rugs).
468 Table cloths woven by Bulgarian women.
417 Council Room, Royal Palace, Stockholm, showing woven wool tapestries and upholstered furniture.

3. FOR OTHER PURPOSES

(1) Paper Making

19 Cut rags after removing from washing drums, paper mill, Massachusetts.
20 Inspecting paper delivered by machines, Massachusetts.
94 Making paper money.

(2) Tents

168 "Brought forth food and set before them."
263 Indian basket weaving.
265 Iroquois Indian tents.
585 Pavilion for officers reviewing troops.

(3) Awnings

535 Idyllic spot where Japanese maids delight to stroll; the houses have awnings.
406 Round Tower, Copenhagen. The shops are protected by awnings.
213 The houses need the protection of awnings.
100 Awning for boat, Hampton Roads, Va.

(4) Sails

27 Sailing vessels passing under Brooklyn Bridge.
514 Block of tenements, China. People living in boats.
525 A Japanese sail boat.

(5) Sacks

35 Filling and sewing sacks of sugar.
119 Covering for cotton bales.
148 Building dikes of sand bags.
295 Coffee from Porto Rico shipped in bags.

(6) Blankets

188 Cowboy, bronco corral, etc.
158 The Indian blanket.
204 Ute Indian blanket.

(7) Trappings

505 Stately elephants on parade.
565 Camel trappings.
494 A sheik and his body guard.

(8) Umbrellas

548 Carrying an umbrella on the way to market, Island of Luzon, P. I.
387 Market place and cathedral, Nuremburg, Germany, stands protected by umbrellas.
501 Umbrellas of India.
60 Protecting the bathers, Atlantic City.

(9) Flags and Banners

260 With the flag goes the public school.
585 Review of troops, Australia.

481 Market scene in Finland.
100 Some of the great warships in Hampton Roads.

(10) Ropes

559 Rigging of vessel.

(11) Fishing Nets

226 First haul of the season.

(12) Wagon Covers

71 Wagon used to haul ammunition.

(13) Mosquito Net

245 Placer mining in Alaska.

II. Clothing

Modern Clothing of Many Lands

Clothing of different countries naturally varies according to materials obtainable, climate, taste, custom and tradition. In these days of rapid travel and easy communication, variations are disappearing. Native costumes are being displaced by the style of clothes worn in America and western Europe.

8, 22, 29, 31, 146, 235 United States; 273, 275 Canada; 305 Brazil; 315 Argentina; 324 Chile; 340 Venezuela; 351, 355 England; 366 Scotland; 375 Ireland; 404 Copenhagen; 423, 424 France; 438 Spain; 443 Switzerland; 452 Italy; 464 Austria; 474 Turkey; 486 Russia; 516 China; 541 Japan; 557 Tunis; 581, 582 S. Africa; 585, 590 Australia. In all these views will be found men and women dressed in such clothes as we are used to seeing, varied, in wool, cotton and silk according to use and climate.

1, 3, 5, 11, 12, 16, 42, 44, 46, 47, 57, 69, 75, 99, 105, 107, 108, 115, 117, 124, 125, 130, 143, 149, 153, 156, 226 United States; 271, 272 Canada; 280, 284 Mexico; 295, 297 Cuba; 310 Brazil; 319 Argentina; 327 Chile; 333 Peru; 339 Venezuela; 357 England; 378 Ireland; 388, 393 Germany; 437 Spain; 477 Greece; 488 Russia; 579 S. Africa. Among laboring people also the same general type of clothing is seen varying in its material and quantity to suit the needs of the people. Notice that the material changes with the climate.

15, 20, 21, 22, 24, 40, 41, 117, 105 United States; 268, 269 Canada; 292 Salvador; 302 Guadeloupe; 319, Argentina; 338 Venezuela; 411 Norway; 419 Sweden; 431 France; 541 Japan; 548, 550 Philippines. These clothes, even though some of them look like caricatures of others, show a similarity which proves how very adaptable our clothes are. They may be made of any material whatsoever and having no parts hanging loose are suited for work.

65, 66, 156 Men who work in hot places, such as smelting works, wear woolen clothing.

246 Alaska; 279 Labrador; 343 North Greenland; 413 Lapland; 328 Magellan Straits. People in very cold countries must wear skins and fur for warmth. Woolen cloth and blankets are used wherever they are obtainable.

481 Finland. This picture was taken in summer.

409, 410 Norwegian women; 418 Swedish girls. Norwegian and Swedish people wear a great deal of homespun wool and linen.

498, 555 The orientals have adopted clothing light, loose and cool. It may be cotton, wool or silk.

560, 561, 562, 563, 564, 565 In Egypt the loose cotton garment has been the dress from time immemorial.

494 A sheik; 566 A bey. The desert night is so cold that desert people must have a woolen coat or blanket in which to wrap themselves.

555 Morocco. Wonderful rugs are woven by oriental peoples. They are used for beds, for floors and even for tent covering.

503, 504, 505, 506 The common garments of the poor in India are made of cotton. Wealthier people wear silk and velvets.

506 Kashmir. The mountain people of India are noted for their woolen cloths, wonderful shawls and carpets.

510 In Burmah, cotton is the common material.

519, 520, 521 In China, too, cotton cloth is worn by nearly every one. Warmth is obtained by padding.

528, 529, 530, 532, 536, 537 Japan. The working people wear cotton cloth often gaily figured.

535 The Japanese wear a great deal of silk, too.

570 Uganda. Bark cloth forms the garments for the negroes of Uganda, Africa.

572 The little clothing worn by these people is probably cotton. Cotton cloth manufactured in America or England finds its way into the remote places of the earth and is worn by savages.

490 Circassians. Here is a curious mixture of the uses of skins, woolen and cotton cloths.

Note: — For a more complete list of Textiles see the Keystone View Company's General catalog. Having pioneered the work of photographing industries for class room instruction we are well equipped to care for your need in this important phase of visual instruction.

THE PUBLISHERS.

34. HOUSEHOLD ADMINISTRATION

By GRACE SCHERMERHORN, B.S.

DIRECTOR OF COOKING IN THE NEW YORK CITY PUBLIC SCHOOLS. FORMERLY DIRECTOR OF PRACTICE TEACHING IN HOME ECONOMICS, IOWA STATE COLLEGE, AMES, IOWA

In House Management, we aim to tie together the work done in Foods, Clothing and Shelter, dealing with the whole subject from the point of view of the home maker. The many problems arise, such as the amount of money to be spent and how it shall be divided; the planning of clothing not for one but for a whole family; planning meals that shall be adequate, economical and appetizing, at the same time planning for the cooking and serving of these meals so that time will be left for other necessary duties and pleasures; systematizing work so the family may be better cared for with less time given to the machinery of the household; and a study of labor-saving machinery together with easy ways of doing work. Very often the other Home Economics courses have not provided instruction in many of the duties necessary in keeping a home, such as laundering, care and cleaning of the house and its furnishings, marketing, how to keep accounts, and home care of the sick. Under these circumstances, the Home Management course must teach the essentials of these subjects so that the student may appreciate their value and realize their importance.

Practice houses offer the best laboratory for teaching this work, but, since they are rare in our public schools, a very helpful substitute may be found in pictures. The stereograph and lantern slides will be found invaluable — especially the stereograph because of its convenience and moderate price and the fact that it is the only picture true to life; the pupil using it becomes a part of the scene. The following list of scenes are helpful not only in suggestions of things to be done and to be left undone, but they also show the household problems of other peoples.

Buying Food

Only as we control market conditions can we control the food for the family. The following market scenes show native costumes, food containers, transportation facilities and buildings.

7 Quincy St. market, Boston.
341 The city baker selling his wares in Venezuela. A marked comparison with our modern methods.
393 A market in Cologne, Germany.
395 Vegetable market in Belgium.
396, 487 Milk delivery — very different from our own methods.
423 Flower market in Paris, France.
447 A market in Switzerland.
466 A market in Austria-Hungary.
469 A market in Bulgaria.
472, 473 Markets in Constantinople.
481 A fish market in Finland.
485 A market in Poland.
548 Market wares.
555 A market in Morocco.
572 A market in Africa.
582 A market in Capetown, Africa.

Laundering

Laundering is an important industry that is being taken from the American homes by the city laundry. Even in the country we find laundries being run in connection with the creameries, so that rural as well as city people are being relieved of this task.

40 Folding and ironing linen collars in a collar factory.
399 The Holland canals offer water supply for laundering.
431 Washing clothes in a river. A common method of laundering clothes among peasant people.
455 Clothes are dried in the streets in crowded city districts.

Household Utensils and Methods of Housework

33 An attractive dining room where the table is laid with doilies. This makes the laundry problem more simple. For the busy woman with limited income, paper doilies may be used.
168 A simple dining service used by the Indians. The squaw prepares and serves the meal but does not eat with the men of the family.
204, 534 Japanese and Indian "baby carriages."
204 Not many sanitary laws are applied to baby's food and surroundings.
534 Baby pacifiers are not confined to America alone.
263 Weaving baskets — a household duty of the squaw because they, with pottery, were used as household utensils. Now this is a pastime for women.

372 Kitchen in Burns' cottage. A good example of the open fireplace that was formerly used for both cooking and heating. Note the orderly arrangement of dishes.

409, 506, 540 Textile industries that are no longer done in the home.

410 Crude cooking equipment of the Norwegian peasant.

411, 413 Milking. An industry from which most American women are relieved. In pioneer days, however, milking the cows was part of most women's daily schedule. Compare the open wooden pails used in Norway (411) with the modern sanitary method shown in 57.

550 Hulling rice for breakfast, Philippine. Note the heavy, crude utensils. All the girls of the family help with this task.

House Planning

An important factor in making housework more easily carried on.

6, 455 Tenement houses where large families live in one or two rooms. Would you prefer a small cottage or this type of house if a family could have only one room?

9 Such a flat roof is often used in crowded city districts in place of a yard.

91, 96 Large, roomy houses but too large for families who cannot keep a retinue of servants.

113, 281, 373, 542 Cottage types which show that houses may be too simple for comfort. These houses allow for no modern conveniences and demand that all processes be carried on in one room. Under such conditions, sanitation and cleanliness are secured only with great labor and effort.

427 When building houses in rolling country, entrances at different levels save running up and down steps.

513 An apartment house in China. Apartment houses have the advantage of having all rooms on one floor. Porches such as seen in this picture add much to the comfort of families living in apartments.

514, 546 These floating houses show that water alone is not enough to produce cleanliness. Where do the children play who live here?

Water Supply

Every home must be supplied with plenty of clean water. This should be made as accessible as possible for the use of the family.

168, 564 Primitive methods of water supply. Not only is the cleanliness questioned but the amount used will always be limited when it has to be carried long distances.

211, 575 Water stored in tanks. With a little extra labor, these tanks could be placed high enough so the water might be piped to the kitchen and drawn through a faucet.

236 In many places, the windmill pumps the water. This may then be stored in tanks (211, 575) and easily piped to the house.

418 The well, if rightly situated, may supply clean water in sparsely settled regions — but why not have it piped to the kitchen so that with a pump the water can be easily obtained?

OTHER KEYSTONE CATALOGS

Class-room experience has fully demonstrated that for any school the first purchase should be this foundation set of classified stereographs and lantern slides. When a wider range of material is desired reference should be made to the Keystone View Company's General Catalog giving a wide range of Travel Tours of the different countries, also special classifications on History, Physical Geography, Industries, etc.

Our classification on the Industries is unusually complete. Keystone first produced stereographs in series telling the story of an industry. The demand came from the schools; Keystone supplied it. Ask for our General Catalog containing special classification of stereographs and slides on industrial subjects. It will be sent free upon request.

THE PUBLISHERS.

INDUSTRIAL ARTS

INTRODUCTION

By CHARLES A. PROSSER, Ph.D.

DIRECTOR DUNWOODY INDUSTRIAL INSTITUTE, MINNEAPOLIS, MINN.

Industrial arts have for their purpose the unification of the community. Their introduction into the schools marks one of the greatest advances in democracy of our age. It was always felt that the professions called for education, but that workers had no use for it. Now we realize that our industrial life demands men and women who are highly trained, resourceful and broad in outlook and that work itself may be educative. These newer ideas are revolutionizing processes of education.

Words are only the names of things. They mean nothing to us unless we have images of the things of which words are only the symbols. To see an object and to learn its name is to add that name as a permanent possession to one's mind. To see or to hear the name and not to understand the object is a sad waste of the child's time and energy. Probably no school system in the world is more guilty of teaching by the use of words unaided by experience and illustration than the American Public Schools. This is due to the wonderful development of the textbook as an aid to teaching.

Most of the arguments against the use of textbook material alone have their bases in what is known among school men as the doctrine of apperception. This doctrine, which is universally accepted in theory today (but more often honored in the breach than in the observance), holds that the human mind learns best when it works from the known to the unknown, from the related to the unrelated, from an experience to its interpretation, from an object to its name, from that in which we are interested to that which will explain it, from a picture to its explanation. Apperception adds to the bare perception the richer significations that are brought by previous preparation or broader experience. It teaches that you cannot develop imagination in a child by words. Imagination is the supreme edu-

cational faculty. It is the imaging of new forms out of old visions and experiences. Apperception teaches that children are interested in things which they understand, things which challenge their effort in moving from what they know to what they would like to know.

The best way to get a clear understanding of any subject, such as the silk industry for example, would be to visit Japan, see the silk fiber made, then to return to the United States and see it manufactured into cloth. This is impossible because of the cost in money and time.

The worst method, and the one we are using today, all too frequently, is to depend upon the printed word to convey ideas to our school children when they have no background with which to apperceive the meaning. The best schoolroom method, in fact the only possible method, is to bring about a combination, a coöperation between the textbook and the supplementary devices to illustrate and to explain.

The number of pictures which can be printed to illustrate any subject must be limited by the size of the page, the picture and the book. They must, practically, be presented in the order of the paging. The stereographs are not hampered by such limitations and the teacher can control the order of their presentation. They are given in relief and in perspective from which pupils gain correct ideas of the relative sizes and distances. The scenes presented by the stereographs are more interesting than the pictures of a book because they are more complete, more exact, more detailed and therefore, more striking. These features make the study of the stereographs much easier from both the physical and mental standpoints.

Classes can, by the use of this material in connection with the training in manual and domestic arts, be given information in a most attractive form about the way in which materials are gathered, transported and manufactured into finished goods. Through the very vivid stereographs, they will come to have a better understanding of the way the world does its work, and the applications and requirements of a wide range of activities. This cannot but aid them in a choice of a life work.

35. INDUSTRIAL DESIGN INCLUDING ARCHITECTURE

By RAYMOND P. ENSIGN

INSTRUCTOR IN DESIGN, SUPERVISOR OF DESIGN CLASSES, PRATT INSTITUTE, BROOKLYN, N. Y.

PART I

INDUSTRIAL DESIGN

With development through the basic relationship to natural physical forces, mechanical powers, and mechanism.

I. ADVANTAGE TAKEN OF NATURAL FORCES

1. The Force of Cohesion in Natural Products

(a) Spanning Spaces

Nature's Work

3 A demonstration of the cohesive force in the material.
200 Nature's use of the principle.
206 A wooden bridge has become a stone one.

Man's Use of Nature's Provision.

242 A board bridges the space between the submarines.
506 Wooden lintels over the wall openings.
41 Crossbeams supporting a floor above.
150 The frame of an automobile offers a good example.
135 Steel girders as used in this and other ways.
27 Suspension bridge depends on cohesive force in cables.
99 The "breeches buoy" needs dependable force in rope.

Man's Improvements on Nature.

See Arches, Domes, Trusses, and Bridge Design in this chapter.

(b) Containers

Cohesive force makes possible all containers.

285 A primitive form of vessel.
65 Immense and dependable containers.
334 Great buckets in a smelter.
19 All boxes depend upon cohesiveness in the wood.
295 The ordinary bag sees rough usage.
311 Heavily laden carts.
518 Rather primitive way of bundling.

498 Pleasing form of container in the foreground.
215 Well wrapped "bundles" of logs.
507 Weird boats standing rough treatment.

(c) Various Applications

Wood

217 Cohesive force in boards, timbers and masts.
113 Every sort of building dependent upon it.
9 A more finished way of building.
536 A simple piece of furniture depends upon cohesiveness.
33 This is true of the most beautiful furniture.
510 A simple example in the graceful neck-yoke.
245 A sturdy shovel handle.
224 Cohesive force in wood gives way before that in steel.
523 Many forces working here. Compare with 224.
443 The carver works against this force.
412 Machines for overcoming the cohesive force in wood.
20 The final result still dependent upon it.

Natural Stone

3 No easy task to work the stone.
206 A peculiar kind of stone.
498 Difficult to wear out.
292 Cohesive force in stone greater than that in corn.
516 Cohesion in the stone roller plus many coolies makes for cohesiveness in the road bed.
569 A magnificent example of this and other forces.
560 Cohesiveness of stone makes possible sculptured decorations.

Manufactured Stone; Pottery and Tile.

123 Extensive use of cohesiveness in cement building.
121 Something of a skyscraper.
171 Attractive concrete construction.
170 A great concrete dam.
252 Concrete even to the lamp-posts.
161 An example in the tile used for draining.
487 Cohesiveness makes possible all pottery.

Metal; Steel, etc.

66 Shaping a steel ingot.
67 Overcoming its cohesiveness.
157 Cohesive force does away with need of containers.
65 The steel hooks will hold an immense weight.
75 Many lives depending upon the chain.
215 The chains make excellent wrappings.
80 Some other force was greater.
82 Built to withstand the pressure of steam inside.
84 Machines for working useful metals.
224 Cohesive force in steel overcoming that in wood.
21 This force makes possible beautiful jewelry.
See Steel Framework Construction, this classification.

Other Mineral Products.

76 Cohesive force in coal.
512 Finding great cohesiveness in gems.
135 Working glass into large plate glass windows.

Leather and Skins.

285 Cohesive force makes pig-skin good container.
507 Another use for animal skins.
See Leather in Products and Industries classification.

Rubber.

131 A remarkable substance in crude form.
132 Peculiar cohesiveness makes for long wearing tires.
133 And in boots keeps the water from your feet.

Miscellaneous.

45 Butter is an everyday example of cohesiveness.
94 Cohesive force helps us hold our fortunes together.

2. The Force of Gravity

(a) Unloading

1 Vast labor done by Nature's force.

(b) Transferring Commodities from One Container to Another

156 Hot, molten metal easily poured.
334 On a large scale.
35 An easy way of sacking sugar.
164 Great ships are loaded rapidly.
128 The bottoms of these cars open to empty the load.
270 Gravity takes the beets into the conveyors.
271 Gravity active in this operation.
64 Pig iron drops from mold directly into car.

(c) Gravity's Force at Work in Various Ways

49 Tremendous energy ready for harnessing.
210 Energy stored in vast amount.
569 Evidences of great power ready for use.
516 Heavy roller doing good work on a road.
108 Elevated tank makes great water pressure.
22 A delicate use of the force.
78 Another simple but clever appliance.
79 An interesting use in the coal breaker.

(d) Specific Gravity

The Buoyant force of liquids and gases

169 A board will float on water. So will a canoe.
39 Heavily laden boats held up by density of water.
507 Interesting ferries in use in Asia.
394 A modern airship riding on the air.
245 Water separates the gold from the dirt and gravel.
242 Submarines can submerge or come to surface at will.

3. Electricity

170 The source of power.
171 Inside the power house.
252 Electric lighting along the Gatun Locks.

4. Light

See Lighting Fixtures.

5. Sound

446 An unusual form of horn.
80 Liberty Bell, 71, 241, 484, and other bells.

6. Evaporation

42 An interesting view of production of salt.
310 Drying coffee makes it possible to keep it.
531 Note the construction of the drying racks.
244 A primitive method.

II. MECHANICAL POWERS

or Simple Machine Principles.

1. Leverage

(a) Balance

Carrying Loads

437 Small boy, large basket.
449 Heavy loads can be "packed" if properly balanced.
487 One way of delivering milk.
378 Not as heavy as it looks.
524 Carefully loaded pack horses.

Poised for Easy Movement

581 A car that can be easily dumped.
65 A tremendous weight but nicely balanced.
335 Adapted to pouring easily.
400 A counterbalance assures easy lifting of the bridge.

The Cantilever Bridge

366 An immense balanced bridge in Scotland.
470 Also built on the cantilever principle.

(b) Levers

418 A homemade affair.
156 A fine example of a lever.
134 A heavy load easily handled.
250 A powerful lever at work.
163 Another steam shovel doing heavy duty.
400 Comparatively little power raises the bridge.
130 Leverage in the handle of the tool.
147 The pitchfork is a much used lever.
518 The wheelbarrow is one kind of lever.

(c) Wheel and Axle

512 An Oriental device employing the principle.
82 A good example in the drive wheels of locomotives.
180 Similar examples in automobiles and tractors.
16 At the extreme right, an example in gearing.
64 A close view of some gearing.
540 An interesting operation.
66 The principle plainly illustrated here.

(d) Pulleys

Fixed Pulleys

69 Simple pulley at the top of the picture.
161 Pulley used to raise and lower.
295 Numerous and useful.
23 Transferring power on a large scale.
54 Belts running on pulleys. Every roller a pulley.

Movable Pulleys

135 Increased power in this arrangement.
150 Ready for work; in the upper right hand corner.
334 Tables running on pulleys, carry heavy loads.

2. Inclined Planes

(a) Inclined Planes

181 Hay being loaded in an efficient way.
216 Logs carried into the sawmill on inclined planes.
440 A good view of an inclined railway.
62 The center of a busy place.
75 A close view.

(b) Wedges

242 Prow of submarines adapted to pushing the water aside.
254 All boats and ships are so shaped.
215 Raft built in this form to facilitate towing.
397 Wedge-shaped piers on bridge to divert water and ice.
470 A great protection to costly bridges.

(c) Screws

153 An efficient machine for loosening the salt.
130 The screw principle on a smaller scale.
443 Every craftsman has one in his vise.

III. MECHANICAL CONSTRUCTION

1. Simple Tools and Devices

(a) Primitive

561 A crude implement for tilling the soil.
488 Rather slow and tedious work.
549 This looks like an unpleasant job.
562 Somewhat pretentious but crude.

550 An interesting set of implements.
498 A well designed primitive mill.

(b) Simple, but Efficient and Up-to-date

143 A curved draw-shave makes rapid work.
531 Note device for holding the side-rails apart.
75 The chain hook adjusts itself to the grade.
78 Exceedingly simple but most efficient.

2. Mechanism Simple in Principle

(a) Levers

156 Mechanical assistance in an unpleasant job.
134 Permitting free movement in all directions.
250 A sturdy lever at work.

(b) Inclined Plane

181 An efficient way of loading hay.

(c) Cranes and Derricks

327 Steam shovel at work on the docks.
334 Traveling crane in a large smelter.
65 The bucket carried by a crane.
82 Used for moving parts of locomotives.
156 First aid in a hot place.
150 Thousands in use in automobile factories.
128 Fascinating type of traveling crane on coal docks.
295 Type of derrick used in loading ships.
122 Derricks in the oil fields.
69 Detail of such a derrick.
70 An interesting moment.

(d) Steam Shovels

163 A steam shovel doing heavy duty.
250 An excellent view of a shovel at work.
251 Testimony to efficiency and value of steam shovel.

(e) Conveyors

34 An arrangement to save much labor.
63 Ready to carry pig iron to the cars.
67 Note rollers on which hot steel beam is carried.
217 Saving much lifting in handling lumber.

(f) Various Mechanisms

334 Carrying and pouring molten metal on a large scale.
45 An improvement on the kitchen churn.
540 An efficient and well built reel.
512 Both hands needed to operate these.

3. Complex Mechanism

64 An interesting arrangement of gears.
16 Faster than block-printing by hand.

15 A machine that is almost human.
150 Some automobiles are simpler but none is simple.
12 A far cry from the cobbler at his bench.
161 Note the "caterpillar" wheel arrangement.
136 This farmer believes in preparedness.
357 A machine that is now out-of-date.
233 Harvesting and threshing on a large farm.
See Multiple and Special Machinery, following.

4. Multiple Machinery

(a) Farming

178 Three furrows at once.
179 Double disc and three-section harrow.

(b) Spinning

24 Production on a large scale.
14 A vast room filled with large machines.
81 As far as the eye can reach.

(c) Weaving

55 Turning out many ribbons at once.

(d) Special

412 Eight blocks fed at once in each machine.
46 An efficient machine in a dairy.

5. Special Machinery

(a) Various Examples

125 The cotton gin.
203 Machine that has made gold mining more profitable.
272 Scene in a tannery.
412 One of the steps in making paper.
153 A useful machine for loosening the salt.
84 Of interest to all of us.
40 Much easier and better than by hand.
46 Rapid and efficient machinery in a dairy.
45 Making butter in immense quantities.
132 An interesting and important process.
313 A modern dredge at work.

6. Steel Framework Construction

(a) Uses

Girders

135 Close view showing shape of edge.
65 Girders showing in upper left corner.
134 Note use in supporting the roof.

Towers

327 A tall shaft for an arc light.
486 For a lamp-post in Russia.

108 A modern windmill tower.
120 A wireless station tower.
421 The Eiffel Tower, nearly 1000 feet high.
254 Basket mast on a modern battleship.

Arches

174 An immense arch over the Mississippi.

Truss

330 Steel truss carrying a railway track.

Cantilevers

366 An immense cantilever bridge in Scotland.

(b) Details of Construction

65 Reinforcement.
129 Reinforced corners.
135 Shaped like letter I or L, to give stiffness.
128 Edges of cars strengthened by the L shape.
581 Edges reinforced by rolling them over a rod.
155 In need of reinforcement.

IV. CONTRAST OF PRIMITIVE AND MODERN DESIGN AND CONSTRUCTION IN INDUSTRY

Agricultural Implements

(a) Reclaiming the Soil

161 Caterpillar tractor wheels lay their own track on hard or soft ground.

(b) Preparing the Soil

561 Primitive plow does little more than stir soil.
488 A crude form of plow and a slow process.
178 A modern tractor gang plow.
180 Efficiency. Rapid work with up-to-date implements.
549 American farmer would dislike the implement and job.
522 Five patient workers.
179 Two operations on a wide area.
332 Modern machinery in South America.

(c) Harvesting the Crops

529 Primitive method of harvesting grain.
357 A reaper of twenty-five years ago.
218 Twenty horse power but doing great deal of work.
233 Steam power combining three operations.
136 An interesting type of corn harvester.
160 Another modern labor-saving device.
181 A rapid way of gathering and loading hay.
147 The hay used to be loaded as these oats.

(d) Threshing the Grain

497 Rather a lack of implements.
479 Footpower threshing floor. Note homemade pitchfork.
284 Another threshing floor and crude fork.
218 A modern way of threshing.
233 No time is lost in getting the grain into sacks.
562 A cumbersome implement but doubtless effective.

(e) Preparing the Grain for Use

550 These tools have pleasing designs but are not time savers.
498 Primitive form of mill, but interesting in design.
292 Grinding corn. Well shaped tools.

V. DESIGN IN INDUSTRIAL PRODUCTS

1. Spacing — Arrangement — Proportion

See Spacing under Architectural Design

2. Objects Whose Form is Specially Adapted to, and Expressive of, Their Purpose

(a) Pouring

334 Excellent examples of the principle.
156 Neat and effective.

(b) Grinding

292 Very simple but pleasing for that.
498 An example well worth study.

(c) Various Purposes

80 A hinge design which is nicely adapted to its purpose.
42 An implement for scraping and pushing.
516 Better than ordinary for the purpose.
210 Arch principle involved in holding the water back.
154 A similar example at the right.
143 Curved drawshave for trimming hams.
543 Racks which allow the carrier to rest occasionally.
487 Milk jars that can be easily cleaned.
446 A unique and effective horn.
80 Bells furnish interesting examples.

3. Objects Whose Form is Especially Adapted to, and Expressive of, the Material and Process of Manufacture

(a) Stone

292 There is no mistaking the idea here.
498 Primitive but pleasing stone mill.
516 Surely convincing of its heavy, stony nature.

(b) Pottery

542 Evidently of a material once plastic.
487 Note general form and handles of the milk jars.

58 Soft lines suggesting that the material was workable.
59 At a later stage.

(c) Metal

336 The simple scrolls tell of wrought iron.
33 The coffeepot is a fine example.
396 Cans in the cart are expressive of thin metal.
80 Form and ornament well worth study.

(d) Wood

536 Proportion and style suggestive of wood.
510 The neck-yoke tells its own story.
33 Wood adaptable in developing designs of chairs.
409 Expressive of the turning-lathe.
506 Note turning and carving on the spinning wheel.

VI. PROCESSES OF MANUFACTURE

See classification Products and Industries.

1. Ornament Adapted to Structure and Structural Lines

See Industrial Products below, and Structural Lines under Architectural Design.

2. Ornament in Industrial Products

(a) Stone

498 The stone sufficiently ornamental.
5 Developing the design in the stone.
92 Simply structural decoration on the marble mantel.
288 Beautiful enrichment of the surface.
567 Still stately though timeworn.
560 The silent sentinel.
252 Well designed lamp-posts of manufactured stone.

(b) Pottery

59 Decorating porcelain in quantities.
33 Quaintly designed china adds to table effect.
487 Simple pottery, but expressive.
542 Sturdy pieces of considerable capacity.
517 Interesting pattern in roof tiles.

(c) Metal

80 Beautiful adaptation of ornament to structure.
336 The wrought iron railing is fine in line.
534 A pleasing railing design from the Orient.
92 Well designed lighting fixtures.
337 An attractive and effective bracket.
351 Unusual refinement in the design of the street lamp.
33 Beautiful play of line on the coffeepot.

(d) Textiles

Woven

263 Developing the designs in the baskets.

See Baskets under Designs in the Arts Allied to Architecture, this classification.

55 Producing ornament by wholesale.
158 Interesting examples of woven designs.
343 A variety from the far north.

Printed

15 Making ready for the manufacturing process.
16 Applying the design in a thoroughly modern way.

Embroidered

487 Beautiful patterns of an Eastern character.

(e) Wood

536 An emphasis of construction the only ornament.
113 The corner construction produces interesting ornament.
409 A good example produced by "turning" in a lathe.
510 Fine design in the neck-yoke, produced by hand.
33 "Turning" and hand carving in the furniture.
92 Well shaped chairs. Mahogany clock on the mantel.
80 Refined and dignified ornament on standard.
506 Quaint "turning" and carving on spinning wheel.
417 Ornate carving on furniture and ceiling.
352 Beautiful enrichment of interior woodwork.
443 Doubtful ornament.

(f) Printed Ornament

15 An interesting commercial development.
16 Ornament repeated endlessly.
94 The kind of ornament with a universal appeal.

See Design in the Arts Allied to Architecture in this chapter.

PART II

ARCHITECTURE

I. ARCHITECTURAL HISTORY

1. Primitive Styles of Building

205 Early North American village; 265 Indian tepee; 113 Pioneer log cabin; 331 Incan Palace Wall; 281 Home of mud bricks; 550 Splint wall and thatched roof; 549 Thatched roof houses on stilts; 298 Thatched roof hut; 409 Timbered cabin.

2. Historic Styles of Architecture

(a) Egyptian

561, 564 Great Pyramid of Khufu; 565 Sphinx; 566 Step Pyramid; 567 Massive Egyptian sculpture; 568 Ruins of Egyptian temple.

(b) Grecian

475 Ruins of the Parthenon on the Acropolis, Athens.
478 Ruins of an important Greek temple.
477 Searching for architectural fragments.
92 Mantel shows modern use of Greek Doric style.
91 Columns, entablature, pediment, etc., Greek Ionic.
90 Architectural details adopted from the Greek Ionic.
89 A modern use of the Ionic capital.
351 Modern uses of the Greek Corinthian styles.
87 Following the Corinthian style in details.

(c) Roman

452 Notable development of arch principle in building.
451 Hadrian's Tomb; note use of arches in bridge.

(d) Byzantine

495 Byzantine church, showing later influence of Mohammedan art in spires and domes.
483 The cathedral essentially Byzantine, but betraying Mohammedan influence in spires and domes.

(e) Mohammedan (Saracenic)

466 Mohammedan mosque, showing the Byzantine influence.
493 Mohammedan minarets in evidence.
558 Typical Mohammedan architecture in the foreground.
502 A beautiful example of Mohammedan art in India.
503 Note the splendid spacing of wall surfaces.
557 An example of fine architecture in Africa.
436 Interior of Alhambra richly decorated in this style.

(f) Romanesque

405 Tower in distance displays Romanesque characteristics.
406 A round tower in the spirit of the Romanesque.
375 This style called "Norman" in England and Northern France.
349 A building of great historical interest.
429 Modern structure in Romanesque style influenced by Saracenic art.

(g) Gothic

360 The cathedral at York is English Gothic.
350 Glimpse showing numerous features of Gothic.
352 An interior in the late Gothic style.
425 A wonderful example of Gothic architecture.
387 Both cathedral and fountain are in this style.
389 The spire of Strassburg cathedral towers at the right.
458 An Italian interpretation of the Gothic style.

457 The palaces at the turn of the canal are Italian Gothic.
434 The Gothic cathedral in Burgos, Spain.
29 Trinity church, at head of Wall Street, in Gothic style.

(h) Renaissance

451 In the distance, the dome of St. Peter's.
450 The Piazza and colonnades before St. Peter's.
28 Old City Hall, fine interpretation of Italian Renaissance.
95 A more elaborate treatment of the Renaissance style.
384 A conservative rendering of this style in Germany.
383 More modern and more ornate.
329 Spanish use of the Renaissance in America.
335 An interesting Spanish version, in America.
241 Another legacy from the Spaniards.
277 Somewhat suggestive of the early French chateau version.
351 Left and right show more classic French version.
90 Dignified American use of the Renaissance, following classic French version.
87 Suggestive of French Renaissance study of the classic.
91 A simpler use of the same style.
482 Russian building influenced by French architecture of this period.
424 Modern French Renaissance.
417 Following the elaborate French Renaissance styles of Louis XIV and Louis XV.
587 Modern form of French Renaissance.
590 Renaissance architectural details.
354 Domestic architecture of the English Renaissance.

(i) Classic Renaissance Architecture in the United States (Colonial)

7 Both buildings follow this style.
8 Another Colonial example. Note the fine doorways.
28 Old City Hall, one of our finest pieces of architecture.
90 Several buildings in this style.
87 One of our imposing buildings.
89 Classic architectural arrangement in an interior.
92 The mantel shows pure classic detail.
91 Good example of Renaissance treatment of the classic.
96 The use of the style in a domestic building.
9 Typical example of our Colonial style in a residence.
10 A simplified form.
33 Architectural woodwork and furniture in Colonial style.

(j) East Indian

501 Showing elaborate detail of style.
499 In the middle distance an example of the native style.

(k) Chinese

521 Oriental love of intricate detail shows in this picture.
520 A closer view of the ornament.

(l) Japanese

526 Showing the rather modest Japanese type.

(m) Skyscrapers

Store and Office Buildings of Steel and Concrete Construction.

26 These buildings house a tremendous office population.
25 Looking down into the mass.
30 A good view of the canyon-like streets.
28 Fine architectural design in a skyscraper.
139 Immense buildings but not so high as those in New York.
121 A simple design in a high building.

(n) Modern Factory Buildings

123 An expressive use of concrete.
152 Fine type of building for the purpose.

See Factory Interiors, this classification.

II. ARCHITECTURAL DESIGN

1. Architectural Composition

Spacing — Arrangement — Proportion.

96 Fine adjustment of spacing between posts.
499 In the foreground, a nicely spaced wall.
521 Well spaced; ornament subordinated to spaces and masses.
354 A most interesting study in spacing.
123 A careful study in modern factory design.
457 Beautiful arrangement in façade of palace in distance.
9 Well proportioned doorway.
80 An excellent example of Colonial panelling.
260 Side windows subordinated to the central one.
28 Fine examples in both the old and new city halls.
90 An arrangement following the Classic.
152 Well balanced spaces in a factory wall.
89 An interior after classic lines.
88 A long wall well broken up.
424 Intricate but well massed.
95 An example of which we may be proud.
425 Splendid adjustment of spaces and masses in this Gothic façade.
352 Beautifully spaced. Richly carved.
503 A superb study in proportion.
502 A lovely work of art.
533 Restrained, dignified and restful.
557 Original and effective treatment of an arch.
241 A subtle variation in sizes, proportions and placing.

2. Structural Lines

The emphasis of structure lines and the subordination of ornament to structural lines and masses.

123 Pleasing effects by emphasis of structural lines and good spacing.
152 A more elaborate structure but with structural lines dominant.
354 The enriched effect made by the structural lines.
96 Enrichment of posts emphasizing the vertical.
339 Pleasing effect obtained holding strictly to lines repeating the main lines of the building.
533 Nothing to distract from the structural.
536 Projecting constructive elements at corners make sufficient decoration.
80 Enrichment following structural lines in bell and standard.
384 Note lines on the dome and its base.
87 A dome which we all know.
95 A modern treatment of a dome. Same principle followed in dome and façade.
28 Rich in examples of this principle.
499 Pilasters used effectively (in the foreground).
89 Structural lines dominant in this interior.
33 Rosettes enriching the doorway yield to the important lines.
425 The Gothic style gives us superb examples.
350 Somewhat hidden by the foliage but still evident.
458 Much ornament but all subordinated to structural lines.
434 A most pleasant arrangement.
352 The Perpendicular Gothic particularly rich in examples.
503 Plenty of enrichment but it is not obtrusive.
502 An architectural wonder.
558 Observe handling of lovely ornament on dome (left).
521 "We may decorate construction, but must not construct decoration."

3. Architectural "Orders"

The classic styles, as shown in columns, and developments from the classic.

(a) Doric

380 Modern use of pure Greek Doric column in the background.
92 The mantel shows use of Greek Doric; column and entablature.
340 Modern use of Doric columns at the left.
8 Colonial adoption of the Doric.

(b) Ionic

91 The Ionic order in the portico; column, entablature and pediment.
90 The Ionic used in two buildings.
89 "Volute" capital closely following the Ionic.
9 A development from the Ionic capital used on pilasters.
384 Renaissance use of the Ionic in the foreground.

(c) Corinthian

351 At the right, classic Corinthian followed closely.
87 The Corinthian order used extensively.

482 Renaissance use of the Corinthian.
460 Typical Corinthian column used for a monument.

(d) Special

478 Ruins of ancient Grecian temple showing fragments of fluted columns.
450 Classic columns used in colonnades.
95 Modern use of classic columns in a composition.
5 Carving architectural capitals.

4. Architectural Design in Openings

(a) Doorways and Entrances

8 A beautiful Colonial doorway.
9 Another Colonial example.
260 Well designed entrance to a public school.
329 A good example of the Renaissance style.
337 Simple dignified treatment of a doorway.
405 Following simple, classic lines.
425 A splendid example of the Gothic.
502 Perfect beauty in the Saracenic taste.
503 A fine arrangement of masses.
520 An example of the Oriental ornamentation.
521 Showing the Chinese arrangement and decoration.
557 A well designed gateway.

(b) Windows

37 Small paned window of the Colonial style.
339 An interesting example from South America.
337 Simple, dignified treatment of a window.
152 Good architectural design in window arrangement of factory.
260 Well spaced group of windows.
362 An interesting treatment in the English style.
354 The English projecting "oriel" window.
387 Early Gothic "lancet" window.
434 Delicate tracery of the later Gothic.
352 Beautiful stained glass windows in the Gothic style.
425 Splendid Gothic examples.

(c) In the Gothic Style

387 Early Gothic; narrow "lancet" windows.
434 Later "geometric" Gothic with its tracery.
352 The interior effect.
425 Splendid examples of the style.

(d) The Oriental Style

557 Saracenic architectural features.
502 One of the most beautiful designs in the world.
503 A beautiful arrangement of spaces and masses.
520 Characteristic Chinese treatment.
521 Subordination of ornament to architectural spaces and masses.

5. Roofs

For examples of Roofs see Architectural Types (a) and (b) in this classification.

6. Architectural Ornament

(a) Egyptian

568 Low relief carving on flat surfaces.
567 Splendid architectural style of sculpture.

(b) Classic

The examples are Renaissance structures in the Classic style.

92 Triglyphs and metopes on frieze of Doric order (mantel).
351 Enrichment of capital and pediment of Corinthian order (at the right).

(c) Gothic

425 Decoration subordinated to structural lines.
350 Decoration rich but well placed.
434 A beautiful composition.
387 Cathedral and fountain in the Gothic style.
458 A beautifully enriched structure.
352 Fine example of Gothic carved decoration.

(d) Renaissance

384 Characteristic of the period.
87 Decoration subordinated.
417 Rich ceiling and carved furniture.
424 An elaborately ornamented modern Renaissance structure.
383 A pretentious design in the style.
590 Late Renaissance details; ornate but not necessarily beautiful.

(e) Saracenic

557 A striking manner of ornamentation.
558 Beautiful treatment of a dome (left).
503 Rather simple but effective decoration.
502 Surfaces inlaid and carved.

(f) East Indian

501 In the fascinating native style.

(g) Chinese

520 Characteristic style of decoration.
521 Rich ornament subordinated to structural lines and masses.

(h) Japanese

536 Exceedingly simple but the projecting corners are effective with the fine spacing.

(i) Details

89 The Ionic capital with its volutes.
5 Carving the volute on a capital.
460 Richly carved Corinthian capital.

33 Rosettes on the doorway casing.
92 Metopes and triglyphs on frieze of mantel.
241 Mouldings well placed.
8 Cartouche in gable.
384 Cartouche over entrance.
282 Urn-shaped finials. Balustrade.
96 Ornamental railing.
283 Ornamental posts and railing.
336 Balcony railing.
425 Pose window; gargoyles; mouldings and bands.
434 Crockets on spires.
352 Richly carved canopy.
502 Inlaid pavement.
560 Architectural Sculpture.

III. ARCHITECTURAL CONSTRUCTION

1. Spanning Spaces

Examples of important constructive principles in the methods of spanning spaces, which methods have affected all Architecture.

(a) The Lintel

506 A primitive example; beam spanning window and door openings and carrying the weight above.
568 The massive lintel construction gave to Egyptian architecture its chief characteristics.
92 The member resting on top of the columns in the mantel is a development of the lintel.
91 The lintel carried over four columns.
351 Several examples here, that at the right closely following the ancient Greek style.
89 An example of a lintel in interior use.

(b) The Arch

200 A natural arch but not constructed according to the true arch principle.
384 A good example of a true arch over the waterway. Note arrangement of stones with "Keystone" in the center.
524 A beautiful arch of olden times.
557 This gateway shows a fine arch.
427 A single arch over a river. Note arrangement of stones.
451 A series of arches in the nearer bridge.
397 A sturdy bridge of many arches.
456 Note beautiful group in center of first bridge.
348 A near view of a series of great arches.
241 Beautiful arrangement of several arches.
452 One of the earliest and most famous examples of arch construction.
260 A modern use of arches. Note keystone and other stones in the second story arches.

89 An interior view showing an arched opening.
174 A magnificent arch of steel construction.
392 A fine example of the use of arches.
210 The arch principle employed in an immense dam.
154 An important use in the construction of canal locks.

(c) The Dome (A development of the arch principle)

451 The splendid dome of St. Peter's in the distance.
384 A massive dome. Note the emphasis of structural lines.
87 Our best known dome.
7 A flatter form of dome.
28 Dome on the *World* Building at the right.
558 An interesting group of domes in the foreground.
483 Graceful clusters of domes in the Oriental style.
502 Splendid example of Saracenic architecture.
95 A modern form of the dome.

(d) The Truss

202 The truss; a built-up structure to span a space.
330 A large inverted steel truss.
270 Countless wooden trusses carrying the roof.
271 Steel truss used to strengthen a floor.
150 Spanning an immense space.

2. Architectural Supports

(a) Columns

92 Doric columns in a mantel design.
8 Doric columns in a doorway design.
380 Doric column as a monument shaft (distance).
89 Ionic columns in an interior scheme.
460 Corinthian column as a monument shaft.
478 Fragments of ancient Grecian columns.
18 Iron columns in a factory.

(b) Columns in Porticos (Intercolumniation)

340 Doric columns at the left.
91 Ionic columns on the White House.
351 Columns in the Corinthian portico at the right.
587 Columns used in various ways.
384 Columns in pairs.

(c) Columns in Rows (Intercolumniation)

450 Doric columns in a colonnade.
90 Ionic columns used in two ways.
87 Stately Corinthian columns.
482 Columns in groups and rows.
424 Grouped arrangement of columns.
95 A modern architectural arrangement.

(d) Piers and Posts

Exterior

568 Study Egyptian piers.
96 Delicate Colonial posts.
109 Heavier stone posts.
152 Piers as a development of the wall.

Interior

272 Simple posts; no pretense to architectural design.
94 Brick posts or piers.
41 Square piers; rounded corners.
171 Stately rows of piers.

Bridge

470 Substantial yet graceful structures of stone.
27 Imposing piers of stone.

See other bridge piers under Bridge Design.

(e) Pilasters

9 Tall pilasters flanking an entrance.
33 Pilasters in a Colonial doorway.
89 Pilasters combined with columns.
29 Superimposed in a façade.
587 Clustered at corners.
384 At corners in the foreground; also used in the dome.
499 In the foreground, dividing wall spaces.
590 Ornate treatment of pilasters.
521 Appearing in a Chinese façade.

(f) Buttresses

Gothic

387 Barely discernible; built up along the side of the cathedral.
425 The design employs the buttresses advantageously.
458 Richly decorated.
350 Flying buttresses in the second story.
434 Flying buttresses clearly shown along the side and at the rear end of the cathedral.
29 On old Trinity in New York.
340 An example at the right.

Other forms

282 Stone buttresses in the foreground.
241 A massive form, at the right.
152 As used in modern factory design.
123 As expressed in concrete construction.

(g) Brackets or Corbels

376 Supporting the parapet.
260 Supporting a balcony.

3. Roofs

For examples of roofs see Architectural Types (a) and (b) in this classification.

4. Materials

For building materials such as lumber, stone, iron, steel, etc., see classification, Products and Manufacturing.

IV. ARCHITECTURAL EXAMPLES

1. Architectural Types

Examples of comparatively modern architectural design from various countries.

(a) Public Buildings

North America.

87 An imposing use of dome and colonnades.
91 Expressive of dignity and democratic simplicity.
95 A building of pleasing proportions.
90 A group of our government buildings.
26 The city "skyscrapers."
25 A nearer view of these office buildings.
30 One of the canyon-like streets.
28 A contrast in proportion, both fine.
139 Typical modern store and office buildings.
152 Typical factory building of today.
282 General view of buildings in modern Mexico City.

South America.

315 A mixture of styles.
340 Classic influence on the left; Gothic on the right.

Europe.

351 A conservative style of architecture, befitting its purpose.
424 More elaborate, in character with its use.
436 General view in Spain.
457 General view in Venice.
383 An ornate structure.
384 Rugged exterior, elaborate furnishings within.
405 The museum is an example of simple dignity in design.
462 Distant view of buildings in Vienna.
482 Many columns used in this design.
468 Modern looking buildings in Bulgaria.
466 Oriental influence evident.
476 Modern buildings with details influenced by the ancient.

Africa.

582 This is surely not "darkest Africa."
558 The Oriental and the European in Egypt.

Asia.

499 European styles in foreground; native influence in background.
521 Elaborate bit of architectural design in Chinese style.
513 The European influence in China.
526 Native architectural treatment dominant.

Australia.

587 An imposing edifice in Melbourne.

Hawaii.

260 Good architectural design and flag look well together.

(b) Domestic Architecture

United States.

9 A good Colonial type.
10 Beautiful setting for a home.
91 A dignified residence of national importance.

West Indies, Mexico, Central and South America.

282 City buildings in Mexico.
299 Modest residences in Cuba.
249 An attractive street in Panama.
304 Interesting treatment on a hillside.
336 A trim and tidy city street.
337 Pleasing design in the houses here.
339 Narrow street but effective unity of architectural treatment.

British Isles.

354 An example of fine village architecture.
355 A famous thatch-roofed cottage.
362 Charming setting for a country home.
368 Interesting domestic architecture.
379 A cottage and a country home.

Holland.

402 Effective unity of treatment.
399 Buildings along a Dutch canal.

Denmark.

405 Houses fronting a canal.

Germany.

389 Residences in a German city.

Austria.

461 Interesting house designs and background.

Switzerland.

447 Typical Swiss architecture.
445 Swiss chalet with wide eaves.

Spain.

434 Rugged character of design in houses.

Italy.

457 Along a Venetian "street."
454 Typical city houses in Naples.
455 One way of decorating architecture.

Syria.

492 Densely populated Beyrout.
493 An interesting arrangement of roof shapes.

Egypt.

558 A mixture of Oriental and European.

India.

499 Another mixture of native and European.

China.

517 Quaint native houses.
514 A tenement district unlike ours.

Japan and Chosen.

526 Native architectural style dominant.
535 Charming house and its garden setting.
534 An intimate view of a Japanese building.
533 Simplicity and refinement in building and furnishing.
543 Peculiar native architecture well shown.

Philippine Islands.

546 Quaint houseboats in Manila.
550 Splint walls and thatched roof.
549 A village on stilts.

2. City Views and Street Scenes

See classification Cities and City Life.

3. Religious Buildings

(a) Temples

568 Egyptian ruins; 475 Athena; 478 Greek ruins; 501 East Indian; 212 Mormon.

(b) Mosques

495, 558 Mohammedan in distance; 503 Indian; 483 Russian.

(c) Russian Churches

483 Note similarity in design to the Mohammedan mosques.
495 Russian church in the foreground.

(d) Cathedrals

350, 360 English Gothic; 425 French; 387 Nuremburg; 389 Strassburg; 458 Italian; 434 Gothic; 429 Romanesque, Saracenic; 324 Comparatively modern edifice.

(e) Churches (Catholic Cathedrals)

451, 450 St. Peter's; 329, 335 Spanish Renaissance.

(f) Churches (Protestant)

406 Trinity, Copenhagen; 6 Old North Church; 29 Trinity, N. Y.

(g) Mission

241 One of the Spanish missions of California.

(h) Tabernacle

212 Mormon tabernacle in the distance.

4. Homes

(a) See Primitive Styles of Building, this classification

(b) Cottages

411 Little more than shelter.
373 Quaint homes in the Highlands.
355 Thatched roof with interesting lines.
372 Cottage interior with modern radiator out of place.
409 Timbered cabin in the background.
445 One of the attractive Swiss chalets.

(c) Village Homes

401 Unity in village architecture.
402 Another instructive example of unity.
399 Dutch houses fronting on a canal.
368 A Scottish type.
447 Swiss residences.
354 Fine example of English village architecture.
362 Surroundings should be considered with building.
535 The Japanese make beauty spots of their gardens.
517 Typical Chinese village.
37 A cottage in our own country.
96 Fine example of Southern Colonial.
10 Attractive setting for a village house.
9 Effective design for house in Colonial style.
33 An excellent example of a home interior.

(d) Some City Homes

91 Suggestive for city or country.
6 City tenements on the right.
264 In the quaint city of Quebec.
339 Attractive designs in modest homes.
337 Restful and dignified in design.
389 Larger city houses.
457 City houses with no front yards.
455 Apparently not enough room inside.
434 Modest but simple and pleasing in style.

526 A crowded city but interesting architecture.
492 Crowded conditions in the Near-East.

5. Historic Homes

91 The home, for a time, of many of our great men.
37 An attractive country house.
96 One of the best known homes in our country.
113 Surely not elaborate architecturally.
9 A house with much historical association.
354 Birthplace of one of England's most famous men.
355 Concerned in Shakespeare history.
372 There was no steam heat when Burns lived here.
362 Beautiful home of one of the great English poets.

6. Historic and Famous Public Buildings

(a) Examples

7 Busy scene near one of Boston's historic buildings.
8 Old State House hemmed in by modern high buildings.
6 Old North Church now surrounded by tenements.
29 Trinity Church at the head of Wall Street.
28 New York's old City Hall, fine example Colonial architecture.
87 Where our laws are made.
89 An imposing architectural setting.
90 A group of buildings in our National capital.
93 The surroundings of our government buildings.
95 Congressional Library, one of our most beautiful buildings.
88 An interior view in the Capitol.
91 The residence of our Presidents.
92 One of the rooms in the White House.
349 One of England's famous buildings.
351 An important building in London.
353 Of importance to all of us.
425 One of the noted buildings in Paris.

For further examples see Religious Buildings, Castles and Palaces and Historic Styles of Architecture, in this classification.

7. Castles and Palaces

367 Tales of Robert Bruce and others center about this old castle.
349 A forbidding looking group of buildings.
376 More formidable once than now.
417 A richly decorated apartment.
461 Commanding position for a castle.
384 A palace which was once a castle.
483 Fortress, palace and cathedral.
451 A castle with unique history.
457 Palace plainly seen at the end of the "street."
436 The palace of the Moorish Kings.
432 An ideal castle situation.

476 Modern palace with architectural detail suggestive of old Grecian influence.
283 A castle nearer home.
331 Arrangement of building stones in early South American palace.
277 Railway station with architecture based on the style of old French castles.

8. Special kinds of Buildings

(a) Concrete Building Construction

123 A simple but effective design.
121 A twelve story building in the southwest.
152 A combination of brick and concrete.

(b) Farm Buildings

159 Many barns on a large farm.
165 Immense barns and two silos.
138 Attractive buildings on a large stock farm.
57 Interior of a modern dairy barn.
211 Ranch buildings.
185 Open hay barn.
56 Laying house, on large egg farm.

(c) Houseboats

546 Evidently a popular style.

(d) Windmills

399 Typical Dutch windmill.
108 Modern windmill on steel tower.

(e) Towers

349 Tower of London contains many towers.
376 A typical castle tower.
442 Quaint water tower or light house.
406 Historic "Round Tower" in Copenhagen.
425 Typical cathedral towers; Gothic style.
434 A series of Gothic towers.
27 Well-known bridge towers.
421 The Eiffel Tower, almost 1,000 feet high.
108 Windmill tower and water tank tower.
122 Countless towers in an oil field.

(f) Miscellaneous

565 An Egyptian pyramid and the Sphinx.
452 An ancient theater, the Colosseum.
424 The Grand Opera, Paris.
260 Modern Public School building.
272 Interior of a Tannery.
227 Interior of a Cannery.
58 Pottery kilns, Trenton, N. J.
56 Laying house, on large egg farm.

176 Shaft house and smelter, zinc and lead mines.
187 Copper smelters in Montana.
62 Plant of the Blast Furnace, Pittsburgh.
116 Blast Furnace, Birmingham, Ala.
79 Coal Breaker, Pennsylvania Coal Regions.
216 Saw mill, near Seattle.
48 Grain Elevator, Buffalo.

9. Monuments and Memorials

561 The Great Pyramid of Gizeh.
564 Another view of the Great Pyramid.
565 The Sphinx and the Second Pyramid.
566 The Step Pyramid in the distance.
567 Colossal Egyptian sculptured figures.
568 Egyptian obelisks in their original positions.
451 Hadrian's Tomb at the right.
558 A beautful mausoleum at the left.
502 One of the world's most beautiful structures.
368 An imposing situation for such a monument.
356 A memorial to England's greatest poet.
387 A beautiful fountain in the Gothic style.
365 Scott Memorial in Edinburgh.
146 Lincoln's tomb — Marshall Joffre at entrance.
380 The Nelson Monument in the distance.
416 Statue of one of Sweden's heroes.
460 A memorial column in the Alps.
283 A soldier's monument attractively situated.

10. Interiors

(a) Home Interiors

33 An interior architecturally dignified and refined.
372 A cottage interior wholly charming except for the modern steam radiator.
533 Fine combination of architectural lines and simple furnishings.
89 An effective design in a public room.
92 A room in which we are all interested.
88 Note the architectural spacing of the walls.
352 A richly treated English Gothic interior.
417 The rich decoration of a foreign council room.

(b) Interiors of Public Buildings

88 Congressional Chamber, Washington, D. C.
89 Supreme Court Room, Washington, D. C.
92 Cabinet Room, White House, Washington, D. C.
80 Independence Hall, Philadelphia, Pa.
352 House of Lords, London.
417 Council Room, Royal Palace, Stockholm.

(c) Factory Interiors

132, 150, 151 Automobiles; 227 Canning salmon; 40 Collar; 156 Copper; 125, 286, 14, 15, 16 Cotton; 134, 135 Glass; 21 Jewelry; 268, 269 Linen; 82 Locomotive works; 94 Making paper money; 141 to 144 Meat packing; 45, 46 Milk and butter; 84 Mint; 57 Modern dairy; 19, 20, 412 Paper; 58, 59 Pottery works; 171 Power house; 334 Refining silver; 553 Rope factory; 133 Rubber boot; 153 Salt warehouse; 11, 12 Shoe factory; 86 Shucking oysters; 541, 53 to 55, 22 to 24 Silk; 65 to 67 Steel mills; 203 Stamp mill; 270, 271 Sugar beet; 34, 35 Sugar refinery; 272 Tannery; 145, 17, 18, 81 Wool.

11. Bridge Design

Look up the principles involved in the construction of an arch, a truss, a cantilever, and a suspension bridge. See Steel Framework Construction, this classification.

(a) Natural and Primitive Bridges

200 Looking under one of nature's bridges.
206 Another work of nature.
507 One kind of substitute for bridges.
408 A small bridge in the country.
554 In the midst of the tropical forest.

(b) Stone Arch Bridges

427 A single arch.
451 A series of arches.
397 A substantial stone arch bridge.
348 An arch bridge of which you have often heard.

(c) Steel Arch Bridges

174 One of the most famous bridges in our country.
50 A delicate looking structure from a distance.
575 A modern bridge in the heart of Africa.
500 The arch above; the roadway suspended.
392 An unusual and effective design.

(d) The Truss Used in Bridge Design

202 A wooden truss.
330 The truss below the roadway.

(e) Suspension Bridges

27 A famous bridge in our Metropolis.
379 A smaller suspension bridge in the country.

(f) Cantilever Bridges

366 An immense and peculiar looking structure.
470 A unique and pleasing design.

(g) Draw Bridge

400 Raised to allow a boat to pass.

(h) Bridges of Special Interest

442 One of the unique bridges of the world.
456 A bridge of much historical interest.
472 A bridge connecting two continents.

(i) Miscellaneous

61 Bridges close together but crossing different rivers.
560 A modern bridge in an ancient country.
375 A beautiful stone arch bridge.
404 A wide bridge in Denmark.
416 What kind of bridge is this?

12. Dams and Locks

(a) Dams

196 Dam made by beavers.
170 Great power dam in the Mississippi.
210 Thoroughly modern dam for purposes of irrigation.
569 A modern achievement in Old Egypt.
253 Emergency dam, Panama Canal.

(b) Locks

252 Comprehensive view of the Gatun Locks.
253 Large freighter in the locks. Emergency dam in position.
154 Ship Canal Locks, Sault Ste. Marie.

13. Landscape Architecture — (See Civic Beauty below, also under classification Orchard, Garden and Wood Lot)

14. Civic Beauty

(a) Streets

380 Wide streets make for city beauty.
504 Wide street and wide sidewalk.
422 Wide streets and sidewalks and trees.
421 A shady street in Paris.

(b) Buildings

87 Government building; 260 School; 425 Church; 424 Opera house; 152 Factory; 354 Unity of architectural style in residences.

(c) Grounds about Buildings

28 The City Hall in New York has little enough space about it.
95 Beautiful grounds and approach to a public building.
90 An abundance of green grass and trees.
93 A well planned scheme.
91 Fine setting for a building.
309 Well kept grounds.
502 An impressive approach.
9 Spacious grounds in front of a residence.

37 Neat and carefully kept.
362 Nature's lavish hand.

(d) Parks

312 A bit of green in the city.
329 Too much concrete; not enough grass.
389 An inviting park in the center of a city.
350 A refreshing view.
126 A small but beautiful spot.
10 The New England "common."
535 The Japanese love to work with Nature.

(e) Bridges

See Bridge Design, this classification.

15. Naval Architecture (Boats)

169 Indian birch-bark canoe.
430 A varied assortment.
97 Detail of a sailing vessel.
119 River boats at New Orleans.
52 Ocean liners at their piers.
154 Lake boats in a great ship canal.
253 Large boat in locks, Panama Canal.
559 On board a liner in the Suez Canal.
280 Ready for a load.
157 Freighter loaded with copper.
254 Battleship in the Panama Canal.
296 Wreckage of the battleship *Maine*.
100 A group of battleships and a cutter.
242 Submarines and larger navy vessels.
313 A modern dredge at work.
415 Whaling ship with whales.
433 Scows in the harbor of Barcelona, Spain.
457 Gondolas and launches in the Grand Canal, Venice.
511 Peculiar native boats, Ceylon.
514 "Tenement" boats, Hong Kong, China.
525 With sail ready for the breeze.
546 Native houseboats, Philippine Islands.

16. Design in the Arts Allied to Architecture

(a) See Architectural Ornament, this classification.

(b) See Bridge Design, this classification.

(c) Furniture

Chairs and tables.

373 Sturdy simplicity; good chair design.
33 Colonial and English furniture; Chippendale near the window.
92 Office furniture pleasing in design.

352 Richly carved throne chairs of the Gothic period.
417 Arm chair in the foreground and the furniture against the walls are of the French Louis XIV design; upholstered chairs "Mongrel."
533 Refreshing simplicity.
532 Well designed stools.
536 Fine in line and proportion.
409 Interesting chairs and spinning wheel.
448 Light, graceful and comfortable willow furniture.

Fireplaces and mantels.

372 Rugged dignity and simplicity.
33 Pleasing Colonial design.
92 Classic design in a mantel.

Canopy.

352 Canopy over thrones in Perpendicular Gothic.

(d) Objects in Stone

498 Shape nicely adjusted to purpose.
292 A crude affair but effective.
5 The process of making.
460 An impressive monument.
282 Fine urn-shaped finials.
560 A majestic sentinel.

(e) Objects in Metal

Lighting fixtures.

417 Candles singly and in multitude.
352 Elaborate candle standards (candelabra) and gas chandeliers.
92 Typical modern designs for electric light wall brackets and chandeliers.
331 An interesting old street light.
337 A fine bracket and street light.
381 A many sided lantern for street lighting.
351 A pleasing design for a street lamp.
486 A post of steel construction.
340 A cluster of lights with substantial post.
380 Gas light and electric side by side.
406 The suspended electric arc light.
312 Tall post with arc light.
521 A Chinese street light.

Railings.

9 Simple, refined design for fence and gate.
336 A good example of wrought iron.
534 An effective design for a fence.
283 Iron railing around a monument.

Bells.

80 Our Liberty Bell Exhibits fine lines.
241 A most interesting grouping.
484 Plenty of chance for choice.

Coffee Pot.

33 An interesting piece of pewter.

(f) Baskets

263 Basket weaving — American Indians.
17 Baskets in commercial use.
117 Splint basket for carrying cotton.
108 Sturdy baskets for heavy loads.
378 Coal baskets in Ireland.
409 Norwegian basket holding wool.
423 Large market basket.
437 A well made basket and a full load.
572 Closely woven baskets in the center of the picture.
530 An interesting Japanese basket.
548 Two kinds of baskets used in the Philippines.
550 A flat kind of basket used in the Orient.

(g) Pottery

58 Firing tableware.
59 Decorating tableware.
33 On the table ready for use.
292 Crudely shaped pottery jar at the right.
487 Interesting milk bottles in Russia.
542 Peculiar shaped pottery in Korea.

(i) Various Objects

510 Note the pleasing lines of the neck-yoke.
372 Simple but effective and pleasing plate and dish rack.
565 A bit of attractive cabinet-work.
409 A spinning wheel such as we have all seen.
506 A quaint spinning wheel and a crude loom.
80 Well designed standard for the Old Liberty Bell.
288 A richly ornamented cross.
502 Geometric design in the pavement.
352 A beautifully carved canopy.
521 Screen-like façade of a Chinese building.

See Architectural Ornament, Bridge Design, and Design in Industrial Products, this classification.

36. WOOD — SOURCES AND USES

By GEORGE M. BRACE, M.A.

DIRECTOR MANUAL TRAINING HIGH SCHOOL, ST. PAUL, MINN.

Wood has been used since the earliest times as a means of producing fire; in making instruments for the securing of food; as a means of furnishing clothing for the body, and as a shelter against the elements.

The oldest Greek temples were built of wood, the later stone temples being faithful copies, even to the wooden pegs used for fastenings.

The ancients used wooden spears, bows and arrows, war clubs and catapults in warfare and in the hunt. Hoes, plows, and carts used in agriculture were of wood. Cloth for clothing was of woody fiber, paper for writing was of the same fiber. The American Indian built his home of wooden poles covered with the bark of the birch tree, and made his thongs from the inner bark of the cedar tree; his canoes were made from birch bark and logs hollowed out by fire and primitive adzes.

Wood still occupies the most important place as a material for house construction and furnishing, and will continue to hold that place until forced out by ruthless waste and lack of forestization.

1. SOURCES

162 A load of logs at the Kettle River landing, Minnesota Pineries. White pine (see also 265) is found in the northern part of the United States and in Canada and has been the most valuable tree in North America. The wood is soft, straight-grained, and yellowish-white in color. It is easily worked and stands well all kinds of weather conditions. Its principal use is for lumber in building operations. It has been so carelessly lumbered in the United States that little or no provision has been made for replenishing the extensive forest lands denuded by lumber companies and fires, while the pine forests of Europe (especially

those in Germany, view 388) have been so carefully lumbered that they furnish a perpetual income to their owners.

107, 98 Georgia pine. It is sometimes called hard pine, long-leaved pine and yellow pine and is much used where great strength is required, as in girders and beams for mills, warehouses, etc. It has a beautiful grain and so is used for interior finish and flooring. It grows upon the sandy plains of the Southeast and yields besides lumber, resin, turpentine, tar, and fiber (which is made from the needles). It is the most valuable pine in the United States.

224 Felling a Douglas fir tree in Oregon. The most valuable tree on the Pacific Coast. The tree fellers usually cut the tree off several feet above the ground where it has a smaller diameter, also the tree near the roots is full of pitch and is not considered first class lumber. The fir tree grows to a great height and of large diameter and being very straight it is used for masts and booms for derricks. It is somewhat similar to white pine in grain, but is more difficult to work and splits more easily.

229 The redwood trees of the west furnish a very cheap substitute for white pine and fir. It grows to an immense size and is reddish in color but is soft and does not hold nails well. However, it resists the elements and so is used for outside finish for buildings.

246, 262, 412 Spruce resembles white pine but splits more easily and is used extensively by paper mills in making pulp for paper. The demands of these mills for pulp wood is so great as to threaten the extermination of that kind of timber.

70 Group of second growth chestnut trees. The chestnut is a soft wood with a beautiful open grain much used for interior finishing. It was formerly a very abundant timber in some of the eastern states but the demand for the young trees for telephone and telegraph poles has made great inroads on the chestnut forests. Pennsylvania has still a large amount of standing chestnut timber, but a tree disease, the chestnut blight, threatens the destruction of these woods.

162 Some small birch trees (standing); 130 Maple; 146 Oak tree (in background); 369 Oak and ash in Scotland. These broad-leafed hardwood trees, maple, birch, oak and ash, are used for furniture making and interior finishing. They all grow in forests in nearly all climates.

255, 297, 307, 552, 570, 577, 554 Show tropical and sub-tropical forests where abundant rain and sunshine assure rank growth.

531, 538, 546, 550 Show bamboo tree used in various ways, almost indispensable in the Orient. It is very light and strong, much stronger in proportion to its weight than any other wood.

247, 249, 301, 551, 566 The palm tree is very useful in the manufacture of rope and fabric and some varieties furnish food and drink for the natives.

For further sources see Plants and Plant Associations.

2. LUMBERING

224 One of the great trees that grow in the rainy Northwest showing method of felling, Oregon.
162 Hauling logs to the river landing, Minnesota Pineries.
1 Landing and scaling logs, Aroostook woods, Maine.
215 Great chained log rafts containing millions of feet of lumber on the Columbia River, Wash. The log rafts are towed in this manner to the mills and sometimes across the ocean.
216 Logs in the mill pond ready to be manufactured.
509 Oriental. Giant beasts of burden. Patient elephants hauling logs from the Salwin River, Maulmain, Burma.

3. MANUFACTURING AND SHIPPING

216 Fort Blakely Mills, largest in the world, near Seattle, Puget Sound, Wash.
217 Ships being loaded with lumber, Puget Sound, Wash.
170 Piles of lumber for construction purposes, Keokuk, Iowa.
523 Primitive manufacturing. Chinamen sawing timbers for the Japanese army, Manchuria.

4. USES

(a) Fuel

Firewood

As fuel all kinds of timber is used, being cut into lengths for stoves and fireplaces. Since it is bulky and difficult to ship, the kind of wood used for fuel in any given region is governed by the nearby local growths.

162, 224, 1 The forests supply abundant fuel. The lumbermen wish only the logs, leaving great quantities of tops and branches of the trees that are available as cord wood for fuel.
412 Showing timber cut to a size where it could be readily split for use in the wood stove. It may be used without splitting and in even greater length in the open fireplace common in Grandfather's day.
113 A type of the pioneer cabin with fireplace built as an addition to the house. These were open fireplaces where logs were burned and cooking done on the hot coals or in vessels suspended from an iron crane which swung over the fire.
372 Shows a modified form of the open fireplace. Here a grate has been built in and the beginning of the stove idea is apparent. The steam heating equipment shown in this scene is, of course, quite modern.

124 In the rear we see piled against the brick building a quantity of wood cut for use in the stove.
467 Immense piles of firewood on the banks of the Danube, Belgrade, Serbia.

Charcoal

103 Wood as charcoal is also used as a fuel for heating homes, especially in warm climates when artificial heat is needed. Before the manufacture of coke, charcoal was much used for reducing iron ore. Here we see them changing wood into charcoal.
543 Korean charcoal carriers who deliver the fuel supply to the homes.

(b) Shelter

263 The Indian uses poles covered with birch bark as a shelter.
113, 409 The pioneer built his log cabin from hewn logs cut in clearing his land.
124, 159, 165, 358 Barns and outbuildings for sheltering cattle and storing crops are constructed mainly of wood.
9, 10 Houses built of wood in the United States; 249, 255 Panama; 278 Newfoundland; 291 Guatemala; 299 Cuba; 343 Greenland; 399, 402 Holland; 409, 411 Norway; 418 Sweden; 445 Switzerland; 534, 535 Japan; 550 Philippines; 591 New Zealand.

(c) In Mining Operations

74, 75, 77, 78, 155, 581 Great quantities of heavy timbers are used in mining operations, to support the roofs, construct shafts and to build tramways.
70, 122 Oil well derricks consume quantities of wood and resemble the forests they are displacing.

(d) Clothing

551, 566, 570 Many tropical trees, mainly palms, furnish material for clothing.
552 The hemp tree furnishes material for the famous Manila ropes.

(e) Wooden Shoes

402, 403 Wooden shoes worn by the people of Holland.
532 All sorts and sizes. A Japanese shoe shop. The shoes are made of wood and rice straw.

(f) Wood Carving

443 Wood carver, Meiringen, Switzerland.
352 House of Lords, fine example interior carving.
33 Hand carved teak wood chest.
92, 89, 417 Fine examples of carved furniture.
521 Fine example of wood carving on Chinese building.

(g) Paper

412 Blocks of wood being converted into wood pulp for the manufacture of paper, Norway. The pulp mills are second only to

the lumber mills in the quantity of timber consumed in the manufacture of paper.

(h) Food

44, 175 Apple; 85 Peach; 234 Almond; 237, 238 Orange; 259 Papaya; 293 Mango; 294 Banana; 303 Cocoa; 551 Coconut. Broad leafed trees furnish our supply of fruit and nuts.

130 Maple trees are a source of sugar and syrup.

537, 538 The mulberry tree furnishes food for the silkworm.

(i) Turpentine and Tar

107 The southern pine is a source of turpentine and tar products.

(j) Miscellaneous Uses

426 Airplane; 316, 152, 31 Automobiles; 175, 153, 48, 429, 438, 556 Barrels; 17, 393, 409, 359, 263 Baskets; 439, 430, 514, 546, 326 Boats; 56, 46, 327, 469 Boxes; 442 Bridges; 44, 160, 162, 177, 181, 562 Farm machinery; 388, 310, 465, 447, 204 Fences; 33, 41, 92, 89, 88, 352, 448 Furniture; 577, 494, 266, 585, 385, 426 Gun stocks; 43, 115, 267, 420 Railroad cars; 163, 330, 43 Railroad ties; 342, 344, 556, 559, 280 Ships; 344, 345 Skis; 308, 309, 324, 449, 43 Telegraph and telephone poles; 47, 71, 138, 147, 311, 378, 396 Wagons and carts; 223 Wind break on sand dunes.

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Classroom experience has fully demonstrated that for any school the first purchase should be this foundation set of classified stereographs and lantern slides. When a wider range of material is desired reference should be made to the Keystone View Company's General Catalog giving a wide range of Travel Tours of the different countries, also special classifications on History, Physical Geography, Industries, etc.

Our classification on the Industries is unusually complete. Keystone first produced stereographs in series telling the story of an industry. The demand came from the schools; Keystone supplied it. Ask for our General Catalog containing special classification of stereographs and slides on industrial subjects. It will be sent free upon request.

THE PUBLISHERS.

37. METALS — SOURCES AND USES

By HARRY S. BITTING

PRESIDENT WILLIAMSON FREE SCHOOL OF MECHANICAL TRADES, WILLIAMSON SCHOOL, PA.

Metals have been known to man for centuries and in the earlier periods of history were fashioned into implements of war, later into crude culinary utensils, then into ornaments and a great variety of useful articles. The process of procuring usable quantities has improved very greatly in recent years, and makes available an almost unlimited supply. Metals of various kinds are being used in all industrial effort in the form of appliances and equipment for production and manufacture of other metal usable products, and in fact for all kinds of products known to man. Its very general use is clearly illustrated in the pictures listed below:

I. SOURCES

Mining Camps

This group illustrates the location of mining camps, where some of the various metals are taken from the earth.

187 Richest mining district in the world, Butte, Mont.
240 Gold miners' camp north of Arctic circle, Alaska.
243 Gold miners encamped at foot of Chilkoot Pass, Alaska.
287 Gold and silver mining camp, El Oro, Mexico.
214 Silver mining camp, Nevada.

Mining Operations

Here we have a series of mining operations representing those below ground, and two styles of surface mining; namely, steam shovel surface work and placer mining.

163 The most modern method of surface mining.
187 Plant in which copper metal is extracted from the ore.
155 Loading cars with copper ore, Calumet-Hecla Mines, Michigan.
287 Rich gold and silver mining center, El Oro, Mexico.
579 Underground mining of gold quartz by the old method of hand picking.
225 Using the force of water under pressure to dislodge the earth in gold mining.

245 Hand method of mining used in working shallow streams, or banks of large streams, also used by prospectors in locating profitable workings.

214 Silver mining, entrance to mines and culm piles, Nevada.

II. PREPARATION OF METALS FOR THE MARKET

Under this heading appears a list of scenes showing the various operations employed in the preparation of metal for the market. Here are smelters and concentrators for the rarer metals which are used principally in the manufacture of jewelry, and by our government in making coins; also the blast furnace where iron ore is converted into pig iron and later refined for the manufacture of steel in its various forms.

Iron and Steel

62 Plant in which metal is separated from the ore by heavy blast furnace process.

63 Machines for carrying molds into which the molten ore is discharged from the furnace.

64 End of the molding machine illustrated in 63 from which the pigs are emptied into the cars.

65 Modern and most efficient method of conveying molten metal from the furnace to the molds.

66 Steel ingot on the "table" of the "blooming" mill.

67 Red-hot steel beam from rolling process being cut into lengths by buzz saw, steel works, Pittsburgh, Pa.

116 Steel furnace in Alabama's great iron center, Birmingham.

61 Pittsburgh, the principal city of metal industries in the world.

Copper

156 Pouring molten copper into ingot molds, Calumet-Hecla Mines, Michigan. Note difference in process between this picture and 65.

157 Loading 1400 tons of copper on boat, Houghton, Mich.

Gold

203 Most modern process of separating gold metal from the ore.

Silver

334 Refining silver in smelter at the famous mining center of Cerro de Pasco, Peru.

Zinc and Lead

176 Shaft house, smelter and tailing pile, zinc and lead mines, Joplin, Mo.

III. ASSEMBLING METAL PARTS OF MACHINES

The different parts of a piece of complicated machinery are often manufactured in several different factories with such precision that when assembled they fit perfectly.

82 General view of the erecting shop, Baldwin Locomotive Works, Philadelphia, Pa.

150 Assembling room — chassis ready for engines — automobile plant, Detroit, Mich.

IV. TESTING MACHINERY

Many experts are required in every large machinery shop to test the different articles as manufactured to see that the different parts have the exact measurements and contain no flaws in the materials used.

151 Experts testing motors in automobile plant, Detroit, Mich.

V. VARIOUS USES OF METALS

Metals are used as a whole or in part of practically all machinery employed in the manufacturing industries. The classification below indicates some of the many uses.

Money Making

84 Presses used by the United States government in the manufacture of metal coins.

94 Machinery used in the manufacture of paper money.

Steel and Iron Tools in Quarrying

3 Steel drill and hammer used in quarrying operations.

4 Quarry in which steam power drills are used.

5 Hand and power steel chisels used in stone decorative carving.

Power Plant Equipment

171 Fifteen large generators in a row, supplied by power from the great dam at Keokuk, Iowa.

Paper Making

19 Rags cut and washed by machinery for use in the manufacture of paper.

20 Inspecting paper delivered by machine, Holyoke, Mass.

Automobile Tire Making

132 Machinery used in the manufacture of auto tires.

Machines for Fabric Manufacture

Machines are constructed principally of metal for the manufacture of cotton, linen, wool and silk fabrics, and our next large and very important group illustrates very clearly the equipment used in fabric manufacture. This group makes clear the broad expanse of the industry and the use of machinery in its connection, as a number of places in this country are illustrated, as well as the interior of plants in foreign countries. Metal machinery is also used in the manufacture of shoes, plate glass, and in fact in about all the manufacturing industries in this country.

Cotton

125 Cotton gin, Greenville, Tex.
286 Carding room, cotton mills, Orizaba, Mexico.
14 Spinning cotton yarn in the great textile mills, Lawrence, Mass.
15 Copying design on copper rolls for printing cotton cloth, Lawrence, Mass.
16 General view in large printing room of cotton mills, Lawrence, Mass.

Linen

268 Winding bobbins in linen mill, linen industry, Canada.
269 Weaving the linen fabric, linen industry, Canada.
40 Folding and ironing linen collars by machinery, Troy, N. Y.

Wool

145 Shearing sheep with power driven shears.
18 Doubling frame in a large woolen mill, Lawrence, Mass.
81 Spinning room, winding bobbins with woolen yarn for weaving, Philadelphia, Pa.

Silk

23 First drawing or straightening of fibers, silk industry (spun silk), S. Manchester, Conn.
24 Spinning, silk industry, S. Manchester, Conn.
53 Drawing warp for weaving silk cloth in extensive silk mills, at Paterson, N. J.
54 Weaving room in the famous silk mills at Paterson, N. J.
55 Machines weaving dozens of fine taffeta silk ribbons, Paterson, N. J.
541 One of Japan's largest modern silk weaving plants, American machinery and American methods, Kiryu, Japan.

Machinery Replacing Handwork in the Tanning Industry

272 Scraping the hair from the hides roughly by machinery, Canada.

Manufacture of Shoes by Metal Machinery

12 Lasting machine shaping shoes, in a Massachusetts shoe factory.
41 General view sewing room, large shoe factory, Syracuse, N. Y.

Metal Appliances in the Manufacture of Plate Glass

134 Method of placing material in furnace, plate glass works, Rossford, O.
135 Polishing plate glass after grinding, Rossford, Ohio.

Excavating

The old style method of pick and shovel excavating is replaced by the powerful steam shovel which contains a complete operating and propelling power plant.

250 Site of the Gatun Lock, looking south from the lowest lock towards Lake Gatun, Panama Canal route.

251 Excavations measuring 500 feet deep in Gaillard Cut, Panama Canal.

Railway Transportation

Metal is used in all kinds of railway transportation equipment such as tracks, bridges, cars and locomotives, for both freight and passenger service.

43 A busy path of commerce in central New York, four track railway, electric road at right, Erie canal at extreme left.
128 A comprehensive view of smaller unloaders at work on the ore docks, Conneaut.
129 A trainload of coal fresh from Pittsburgh fields for Lake Superior consumption, Conneaut.

Water Transportation, Shipping and Naval Vessels

Water transportation is largely dependent upon metal of all kinds for hulls of vessels, power plant and auxiliary machinery; in fact, all but a very small percentage of this equipment is made of metal.

52 Great ocean liners at the docks, Hoboken, N. J., showing upper Manhattan Island and Hudson River.
154 Greatest canal traffic in the world, busy scene in the ship canal, Sault Ste. Marie, Mich.
164 Looking between ore docks 2 and 3, Two Harbors, Minn.
252 North over Gatun Locks and sea level entrance to Panama Canal, Atlantic Ocean in the distance.
253 South over Gatun Locks and Gatun Lake, emergency dam in position — A busy scene on the Panama Canal.
242 Submarines in the foreground and battleships and torpedo boats in the background, San Diego Bay, Calif.
254 *U. S. S. Missouri*, the first battleship to pass from the Atlantic to the Pacific without "rounding the Horn," Panama Canal.
280 Mexico's principal harbor, Vera Cruz.
296 General view of the wrecked battleship *Maine*.

Bridge and Elevated Railway Construction

Metal as used in bridge and elevated railway construction in all parts of the world.

27 The great Brooklyn Bridge, New York, N. Y.
31 Many forms of transportation required in large centers of population, New York City — elevated railroad, surface cars, automobiles and entrance to subway.
101 Harper's Ferry, W. Va.
330 In the heart of the rugged Cordilleras Mountains, the Cofa Bridge on the Oroya Railway, Peru.
366 Highlanders in native costume at the great Forth Bridge, one and one-half miles long, spanning the Firth of Forth, Queensferry, Scotland.
379 Suspension bridge, Kenmare, Ireland.
392 The great bridge over the Rhine at Bonn, Germany.

470 The great railway bridge over the Danube River at Cerna-Voda, Roumania.
500 The Howrah Bridge over the Hooghly River in Delta of the Ganges, Calcutta, India.
575 Scene above bridge on the Cape to Cairo Railway, over Zambezi River, near Victoria Falls, Africa.

Oil Well Drilling and Preparation of Oil for the Market

Oil well drilling, preparation for the market, and storage of the crude and finished products are dependent largely upon metal for desirable equipment.

69 Standing at right of man filling shell is steel drill.
122 Spindle Top, an important oil well region near Beaumont, Texas.
123 Crude oil stills and can factory, Port Arthur, Texas.

Metal Saws Being Used in This Country and Abroad

Metal made saws are used extensively throughout the world as is indicated by the pictures illustrating their use in this country and in Japan.

67 Red-hot steel beam being cut by buzz saw, Pittsburgh.
224 One of the great trees that grow in the rainy northwest, showing method of felling, Oregon.
523 Chinamen sawing timbers for the Japanese Army, Manchuria.

Chains and Cables

215 Metal chains used in fastening logs together for purpose of water transportation.
471 Chains used for fastening vessels to the docks.
27 Cables used in large bridge construction.
75 Chain used for attaching mine car to hauling cable.
379 Cables used in long span suspension bridges.

Metal Used in Cannon Construction

73 Old style brass cannon, Gettysburg, Pa.
39 Brass cannon used in Revolutionary War, West Point, N. Y.
254 Modern steel guns on United States battleship *Missouri*.

Metal Used in Bells and Chimes

This group of pictures represents bells cast of a metal alloy which is made up of several ingredients and tuned for chimes, church tolling and other purposes, the principal one of which has been the casting of the dear old Liberty Bell now resting in the Cradle of Liberty, Independence Hall, Philadelphia.

80 The old Liberty Bell, Independence Hall, Philadelphia, Pa.
241 San Gabriel Mission, Southern California.
484 The great bell market at the fair, Nizhni Novgorod, Russia.
71 Small bronze bells on harness.

Modern Methods of Agriculture

Within the last twenty-five years methods of agriculture have been completely revolutionized by the use of labor saving machinery and devices of various kinds, which have made an extensive demand upon metal for a principal part of their construction. The machines and devices in which metal plays an important part are represented in the following groups, under sub-headings, showing clearly their application in modern methods of agriculture.

Spraying

44 Orchard spraying by use of metal force pump.

Buttermaking

45 Metal trimmed, power butter churns.

Milk Bottle Filling

46 Automatic machine for filling and capping bottle of milk.

Preparation of Soil

178 Plowing rich prairie soil with tractor, S. Dak.
179 Making a good seed bed — tractor drawing double disk and three-section tooth harrows, S. Dak.
180 Manure spreader followed by tractor plowing sod near Omaha, Neb.
332 Tractor with cable drawing harrow and pulverizer to prepare soil for planting sugar cane, Lima, Peru.

Cultivation of Crops

198 Cultivating a field of beets in Colorado.

Drainage of Swamp Land

161 Reclaiming swamp land — digging ditch with tractor and laying drain tile, Wisconsin.

Harvesting Crops

136 Modern methods in corn harvesting — cutter and binder at work on an Indiana farm.
160 Harvesting and loading silage corn in Wisconsin's famous dairy region.
166 Potato digging machines at work in the famous potato region of the Red River valley, Moorhead, Minn.
181 Handling alfalfa hay with hay loader on the farm of W. J. Bryan, Lincoln, Neb.
218 Harvesting in the great West — combined reaper and thresher, Washington.
233 A combined steam harvester which reaps, threshes and sacks, California.
357 Harvesting wheat in Old England.

NOTE: For additional industrial stereographs slides see our General Catalog which will be sent upon request. It contains a wide range of scenes ize our great industries in an effective way.

THE PU

38. CONCRETE, STONE, BRICK AND TILE

By CHARLES M. SPOFFORD, S.B.

HAYWARD PROFESSOR OF CIVIL ENGINEERING IN CHARGE OF THE DEPARTMENT OF CIVIL AND SANITARY ENGINEERING OF THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY AND HARVARD UNIVERSITY

The growth of civilization may be clearly traced by the varying uses which man from time to time has made of stone. The crude stone implements of labor and defense developed by primitive man clearly marked his supremacy to the beasts in providing for his material needs; the beautiful statues of the Greeks, and the marvelous cathedrals of the Middle Ages testify to the growth of his spirit; the great stone and concrete structures of today to the wonderful development of his mind.

Although the qualities of strength, permanence, and beauty found in stone have been of the highest importance to man, its characteristic of decomposing into fertile soil under the long-continued influence of rain and frost has been indispensable to his very existence. As explained in the chapter on Weathering in the classification on Natural Forms and Forces, and in the chapter on Soils in the Agriculture group, the earth would be a barren desert void of animal and vegetable life were it not for the decomposed rock of which its soil is entirely formed.

The development of other materials of construction in recent years has tended to diminish to a considerable degree, the use of natural stone for constructive purposes, and while it is still extensively employed for important buildings, bridges and dams, and for street pavements in our large cities, it is possible that in the modern concrete, we have at last developed an artificial stone which may ultimately prove more valuable for constructive purposes than natural stone.

Concrete is the name given to a compound formed of cement, sand, and small stones, mixed with water until it flows

used for frames of buildings as well as for
and the like, is, however, coarse in appearance ar
shows plainly the grain of the timber molds in
formed. It can be given a pleasing appearance
use of stone cutting tools, or by a process rese
papering followed by rubbing.

While concrete was used by the Romans, the
Rome furnishing a notable example, it did not co
eral use until the twentieth century, when the
strengthening it greatly by steel rods to take the
strains, which concrete cannot resist, was first
utilized.

Since 1900, the employment of this new buildi
called in this country "reinforced concrete" and
"armoured concrete" and sometimes called "the
a steel backbone" has increased with tremendous
one now sees it employed in some way or other i
all pieces of architectural and engineering cons
rapidly growing use for roadway surfaces being
most recent phases of its development. The era
implements were commonly used by man is calle
Age; possibly the near future may go down in hi
Concrete or Artificial Stone Age.

I. STONE.

Crude Stone Utensils

292 Crude stone table and rolling pin for preparing foo

Some Ancient Stone Ruins

205 Ruined homes of the cliffdwellers in the Mesa Verde, Colorado.
284 Pyramid of Sun, San Juan, Teotihuacan, Mexico.
331 Massive stone walls in the old Incan Palace, Cuzco, Peru, S. A.
452 The Colosseum, the "King of Ruins," Rome, Italy. Capable of seating about 80,000 people before its partial destruction.
478 Ruins of the Temple of Zeus, Olympia, Greece.
561, 564, 565, 566 Egyptian pyramids. Tombs of the rulers of Egypt about 4000 B. C.
565 The Sphinx, Gizeh, Egypt. A colossal and mysterious statue.
567 The Colossi of Memnon, Thebes, Egypt. Enormous figures carved from a single block of stone, which once guarded a great stone temple.
568 The famous stone ruins at Karnak, Egypt.

Some Sources of Building Stone

3 Quarrying granite at Concord, N. H. Drilling preparatory to splitting.
4 Marble quarry, Proctor, Vt., said to be the largest single quarry opening in the world. From this shaft the veins of marble are mined in various directions.
5 Chiseling marble — architectural department — Vermont Marble Company, Proctor, Vt.
51 Picturesque palisades of the Hudson River. Great quantities of stone were removed from the cliffs until this area was set aside as a public park to prevent the destruction of its beauty.

NOTE: For a general idea of rock formation throughout the world, see the classification on Natural Forms and Forces, and for both granite and marble industries in detail, see the Keystone View Company's general catalog.

Some Noted Stone Buildings

87 The Capitol; 91 The White House; 95 Congressional Library; 309 Municipal Theater, Sao Paulo; 315 Government buildings, Buenos Aires; 340 National University, Caracas, Venezuela; 349 Tower of London; 350 Westminster Abbey; 351 Bank of England, London; 367 Stirling Castle; 376 Blarney Castle; 383 The Reichstags-Gebaude, Berlin; 384 Royal Palace, Berlin; 387 Cathedral, Nuremburg; 424 Grand Opera House, Paris; 425 Notre Dame Cathedral, Paris; 429 The Cathedral, Marseilles; 432 The Prince's Castle, Monaco; 436 Alhambra Palace; 451 The Castle of San Angelo and St. Peter's Church; 458 The Cathedral, Milan; 483 The Kremlin, Moscow; 502 The Taj Mahal; 587 Federal Parliament building, Melbourne.

Stone Combined with Steel in High Buildings

25 Looking down on New York skyscrapers from the Woolworth Tower, itself the highest business structure in the world. These buildings are made possible by the use of a steel framework to support the floors and to carry the stone curtain walls.

273 Main Street, Winnipeg, Canada.

Stone as Masonry for Bridge Abutments and Piers and for Arches

27 Brooklyn Bridge, New York. A marvel of the world fc years because of its great height and span, but now su by other bridges.

174 The Eads Bridge, St. Louis, Missouri. A famous ste bridge with stone piers.

348 London Bridge. The most noted bridge of history.

366 The great Forth Bridge spanning the Firth of Forth, Quee Scotland. Pending the completion of the bridge across Lawrence River at Quebec, this bridge had the longes span in the world.

375 Patrick's Bridge, Cork, Ireland. An attractive stone arch ture.

379 Stone abutment and pier of suspension bridge, Kenmare, I

392 Steel arch bridge over the Rhine at Bonn, Germany, witl piers.

397 Stone arch bridge across the Meuse, Namur, Belgium.

416 The Vasa Bridge, Stockholm, Sweden.

450, 451 Roman stone arch bridge over the Tiber.

470 The railway bridge over the Danube River at Cerna-Vod mania. Made famous by its importance in the European

Stone Construction for Irrigation Dams

Great dams such as these may have their interiors formed of c but they are usually faced with stone.

210 The Roosevelt Dam near Phoenix, Ariz. Instrumental claiming vast areas by irrigation. Composed of concret with stone.

569 The Assuan Dam, Egypt, built to control the waters of t

288 The sacred shrine on Cholula Pyramid, Mexico.
380 Dublin, Ireland. Lord Nelson monument in distance.
416 Monument near Vasa Bridge, Stockholm, Sweden.
433 Columbus monument, Barcelona, Spain.
450 Egyptian obelisk in court of St. Peter's Cathedral; also Castle of St. Angelo, and the Emperor Hadrian's tomb.
460 Monument to Empress Maria Theresa, Innsbruck, Austria. An impressive setting is formed by the Tyrolean Alps in the background.
502 The Taj Mahal, a beautiful marble memorial building.
560 Monument on the great Nile Bridge in Egypt.
561, 564, 565, 566 The Pyramids. Monuments of ancient Egypt.
565 The Sphinx, a noted memorial.
568 Obelisks and other monuments in ruins at Karnak, Egypt.

Some Other Uses of Stone

6, 380, 464, 474, 486 Stone blocks used for paving in modern cities.
43 Stone as ballast for railway construction. Without stone or other similar firm material as ballast, modern high speed traffic would not be safe.
184 Stone fencing.
206 Petrified tree, forming a natural bridge.
372 Flat stones for flooring in primitive homes.
412 As an abrasive material. Grindstones converting blocks of wood into wood pulp.
516 Huge stone roller compacting a stone road bed.
524 Great wall of China.

II. CONCRETE

The composition of concrete and its method of manufacture have been described in a general way in the statement at the beginning of this chapter. It may be stated here that Portland cement, which is the vital element in concrete, is obtained from a mixture of calcium carbonate and silicate. These substances are found in many forms, a common combination used in cement making being that of limestone and cement rock, the latter being itself an argillaceous limestone. A considerable amount of Portland cement is also manufactured from a combination of blast furnace slag and limestone. The stones are mixed in the proper proportions and ground to a fine powder which is calcined in a kiln. The clinker formed by the calcination is then ground to an impalpable powder, as fine as flour, and allowed to season some time before using. In case the raw material from which the cement is formed consists of soft or wet materials, such as chalk and clay, the mixing prior to the calcination is done by the so-called wet process.

Portland cement mixed with water will gradually harden into a stone-like substance either in the air or under water. When stone and sand are mixed with it, it also hardens and gives the modern concrete of which vast quantities are used. A useful and economical mixture for

Reinforced concrete is usually made of one p...
of sand and four parts of stone.

123 Modern reinforced concrete factory building.
154 Concrete construction at the famous locks of the shi
Sault Ste. Marie, Michigan.
170 Concrete construction in dam, power plant, and loc
Mississippi River at Keokuk, Iowa.
171 Concrete columns in the electrical power plant at Keol
where the falls of the Mississippi are converted into
210 Concrete spillway construction and a concrete bridge at t
velt Dam near Phoenix, Arizona.
252 Concrete construction at the Gatun Locks, Panama Can
253 South over Gatun Locks, Panama Canal.

III. CLAY PRODUCTS

Baked clay products, such as brick, tile, china and other p
made by molding wet clay and baking in a kiln until the piec
hard and strong. Bricks have been used since very ancient tin
are mentioned in the Bible, and the Egyptians and Romans
tensive use of them; they still constitute one of the mos
forms of building material. In hot climates, sun-baked br
out of special clay called adobe are extensively used. In E
bricks are formed by mixing the adobe mud with choppe
give it coherence — the Nile mud lacking in this respect, the
making bricks without straw mentioned in the Bible was by n
imaginary one. After mixing, this material is then molded
and dried in the sun.

Primitive Pottery

292 Earthenware jar made by Central American natives.
487 Russian peasants delivering milk in earthenware jar
542 White-robed pottery peddlers, Seoul, Chosen.
564 Egyptian carrying water jar on head.

colors and patterns, and have been used for many centuries for decorative and other purposes. The Alhambra in Spain furnishes a notable example of their use in decoration, and other important examples are found in the mosques of the Orient. Roof coverings of semi-cylindrical unglazed tiles are common in Spanish-speaking countries, both in Europe and America, and are frequently used for important buildings in the United States. At the present time, tiles are extensively utilized for sanitary purposes, and the bathroom and kitchen of today are floored and walled with them, their smooth, water-repelling surfaces being dirt and vermin proof.

171 Terra cotta floor; 299 Santiago, Cuba; 338 Terra cotta roof, La Guayra, Venezuela; 394 In a German town; 402 Dutch village; 430 Cannes, France; 434 Burgos, Spain; 436 Granada, Spain; 475 Athens, Greece; 492 Beirut, Syria; 517 Wuchang, China; 526 Tokio, Japan; 543 Chosen.

Drain Tile

161 Reclaiming swamp land by means of tile drains.

Adobe Brick

211 Adobe house wall at end of garden.
281 Buildings constructed of adobe bricks.
564 Adobe hut on Nile River, Egypt.

Brick of Fired Clay

6, 8, 32, 138, 152, 398 Brick used in the construction of buildings of various types.
282 Brick paved roofs in the City of Mexico.
524 Ancient brick used in construction of the Chinese Wall.

Clay as a Carrier of Precious Stones

581 Blue earth clay banks rich in diamonds, Kimberley, South Africa.

NOTE: The Keystone series of industrial stereograph lantern slides is unusually complete. It gives the imp processes in a great range of industries. Our General C contains this list of the industries together with Travel and miscellaneous scenes in all the important countries world. It will be mailed free of cost upon request.

THE PUBLISH

39. LOCAL INDUSTRIES

By CLIFFORD B. CONNELLEY, Sc.D.

DEAN SCHOOL OF APPLIED INDUSTRIES, CARNEGIE INSTITUTE OF TECHNOLOGY, PITTSBURG, PA.

Fortunately for us, there is no law compelling the child to follow the parent's occupation; there is, however, a psychological compulsion which constrains the average child toward the things with which he is familiar. Every child is vastly interested in what the grown-up people about him are doing and very many of them grow up with the idea of pursuing the same work they have seen.

Usually children cannot visit mills; they cannot see the actual operations that must be performed. In too many families the worker disappears at one fixed time and reappears at another. What happens in between is a dead mystery. These views will open to the child the life that goes on about him. They will give him accurate ideas, will enable him to think himself in relation to actual processes; and when he finally enters some industry, he will adjust himself more easily than would be possible if he were in entire ignorance. Surely there should be a place in school for this pre-vocational training, for it is an important matter that children shall be prepared to some degree for the work toward which they are consciously or unconsciously tending.

COAL

Thousands of men in all the countries of the world are engaged in mining. Methods are being improved and safety devices applied so as to safeguard the men and at the same time increase the output. Skill in handling tools, acquired in Manual Training, is surely a great help. It is the chief local industry in many parts of our country, especially in Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Kentucky, Colorado, etc. The anthracite coal mining here shown is confined to eastern Pennsylvania.

74 Stripping or surface mining is the simplest form. Steam shovels must take off the layer of dirt which covers the coal. Railroads must be built to market the produce. Mining engineers must make the plans for all this work.

75, 76, 77 Underground mining is more difficult. It calls for great strength and carefulness for the use of explosives is dangerous. The hole must be properly drilled, the blast carefully prepared and then the loose coal shoveled into the car. It is a strong man's work. These men should have safety lamps.

78 The slate picking and (79) breaking and sorting of the coal are less important operations.

IRON AND STEEL

No industry calls for more carefulness and skill than the iron and steel industry. The white-hot or red-hot metal is carried about, poured, rolled, cut, etc., and the men must watch every minute and must know just what to do to avoid accidents. This strain, even more than the labor, tires the workers. The Manual Training work in metals is a splendid preparation for the iron industry.

61 Pittsburgh. Very many of the boys of this region find work in the iron and steel mills. This is an important local industry in many parts of the country. Coke, limestone, iron ore, etc., are put into the blast furnace in proper order and proportions. The men must watch very carefully to know when the metal is ready to pour and then the furnace is opened very carefully, the white-hot metal runs out into the trough shown in the middle foreground (63); the pig iron molds are filled, run out and empty themselves into the car (64).

65 Filling molds with steel. This work takes the greatest care. The furnace men use every precaution against danger in opening the furnace and letting the metal run into the ladle. These men are regulating the flow into the molds. The work is very hot, the metal is white-hot. If the lever were to slip or the ladle which holds probably twenty-five tons of metal should slip, lives would surely be lost.

66 These men look very leisurely just now. They are skilled laborers and their work is very hot and exacting. They keep the machine in the best working condition. They watch the rolling process very attentively and turn out good work.

67 This is hot work too. The men must watch very closely, for sometimes the end of the red-hot beam which is being moved along sticks and the whole thing doubles up and twists about. Of course the next beam will be stopped and thrown out. It is very dangerous. All these machines are run by skilled laborers.

COPPER

Copper mining is a local industry only in certain states, as Michigan, Montana, Idaho, Utah and Arizona, but copper working, and especially when used with the alloys to form brass and bronze, becomes a local industry in every important industrial center. The copper industry is a very old one yet it has developed wonderfully in late years because of its use in electrical appliances and munitions, and because water does

not affect it. Very many young people in the vicinity of the copper mines become workers in that industry.

155 When mines grow large the roofs must be propped with timbers. All sorts of precautions must be used for safety. Notice the safety lamps. Mechanical drills bore holes into the rock. These holes are filled with dynamite which loosens the rock. It is then shoveled into cars and taken to the surface.

156 The smelting of copper is hot work and it needs skilled laborers. Notice with what precision and care these men are working. The molds are somewhat like pig iron molds, but much smaller.

157 When molded the copper is ready to be carried by railroad or by water to places where it will be made into useful articles. Very many boys go into railroading or become sailors on these lake vessels.

PETROLEUM

The drilling for and pumping of petroleum is a valuable local industry in such states as Pennsylvania, West Virginia, Ohio, Indiana, Illinois, Oklahoma, Texas, California, etc., while the refining and handling of the products is a local industry in many centers.

The first productive oil well drilled by Col. E. L. Drake in 1859 in Crawford County, Pennsylvania, marks the beginning of the oil industry in the United States.

69 To be a successful driller, one must know and be able to judge the land which is to be drilled. The machinery must be cared for too. The work is hard and calls for judgment and resourcefulness.

70 The shooting of wells is a dangerous operation and must be done very carefully.

122 The oil is pumped into pipes and carried to refineries and then to the large cities of the United States. Benzine, gasoline, naphtha, kerosene, lubricating oils and paraffin are obtained by refining petroleum.

MARBLE AND GRANITE

There are vast strata of these stones in various parts of the United States. As yet the marble and granite industries are local industries in New Hampshire, Vermont and Tennessee. Boys entering these industries should have instruction in Drawing and Design just such as Manual Training offers. We are now depending upon skilled laborers who have been trained in European countries. What are we to do when the demand exceeds the supply for this type of an artist?

3, 4 Here is another industry where men must use the greatest caution. Holes must be drilled, powder or dynamite used to blast the rock loose and the falling or loosened rock must be watched.

5 Work such as this takes a sure hand and a training in drawing. The beautiful carvings in stone that decorate our best public buildings are done in this way. The work is hard on the lungs.

THE AUTOMOBILE INDUSTRY

The making of automobiles is a highly localized industry centering in Detroit which has exceptional facilities for transportation.

152 In the Ford factory each man does a specific piece of work. He becomes very skilful in that one thing but not necessarily a skilled workman.

150 In the assembling room the manufactured parts are brought together in an automobile.

151 Experts test each engine before it is finally set in place.

TEXTILE INDUSTRIES

Among the local industries of the cities of the East the making of textiles is probably the most important. In such cities as Lawrence, Mass., Manchester, Conn., and Paterson, N. J., a large proportion of the young people find employment in the textile mills.

COTTON INDUSTRY

119 The cotton comes to the mills in bales.

286 It must first be cleaned and carded.

14 Spinning makes the cotton into yarn. These girls stand to reach quickly. They must watch that the thread does not break or snarl.

15 Much cotton cloth is printed. The design must be made and transferred to copper rolls. The Arts and Crafts courses of our Manual Training departments are giving good preparation for such work.

16 The cloth is then printed, starched, dried and folded ready for market.

WOOLEN INDUSTRY

17 Wool must be sorted before it is ready for making into cloth.

409 It is cleaned and carded. In the United States these operations are performed by machinery.

81 When carded it is ready for spinning. These machines call for constant watchfulness and care.

18 The threads are then joined and twisted to make it of the right size and then it is ready for weaving.

THE SILK INDUSTRY

All of our silk is imported from other countries.

540 In Japan the thread is carefully reeled from the cocoons and is shipped in skeins.

22 The skeins must be sorted and weighed. Such work calls for discrimination.

23 Usually the raw silk comes in bales and the fibers must be pulled apart and laid smooth ready for spinning.

24 Next the silk is spun into thread and now is ready for weaving.

53 Warp must be drawn. This is a very delicate operation. Look at the lengthwise thread in a piece of silk lying so closely side by side and you will see what these men have done.

54, 55 Weaving is shown in these views. This is work for skillful operators. The threads are very fine, they break and snarl very easily and must be watched constantly, else the silk will have a flaw.

AGRICULTURE

Agriculture is carried on in every part of our country, but conditions are so different in various places that it really divides itself into a group of local industries. Cotton, for instance, must be raised in the South; wheat on the northern plains, etc.

One of the greatest advantages of our consolidated rural schools is that Agricultural and Manual Training departments can be maintained. These raise the agricultural profession to an interesting art, which fascinates the learner so that he never desires to abandon it.

The correct use of tools is an asset to the boy on the farm. He is able to do things the blacksmith and carpenter formerly did.

136, 161, 177 to 180 These are very intricate machines, very liable to get out of order. The boy who has had forge work, who can set a rivet, replace a valve, who is familiar with machinery, has a distinct advantage over the one without such training. A farmer is constantly doing work as carpenter and finds his Manual Training useful.

147 He must make a frame for his wagon so that he can haul hay or grain.

124 He may wish to enlarge his wagon box to carry a bigger load.

175 He may need to make crates or boxes for fruit or potatoes.

185 His training in woodworking may be turned to good account when he has to build a shed or make a feeding trough.

56 Again and again farmers must build chicken coops and fasten up boxes for nests.

130 And also he will have learned what trees on his land should be cut and what left to conserve his timber land.

33 Girls in Domestic Science will have learned to keep a clean house. They will not, perhaps, have houses of this kind, but they will be clean and tasty and the food will be appetizing and nourishing.

83 Girls will know how to use garden vegetables, to can tomatoes, beans, corn and beets and supply vegetables for winter.

85, 175 The farm woman who learned in Domestic Art how to preserve the fruit of the farm in the cheapest and most effective way has a decided advantage over the less fortunate woman who must learn by experimenting.

15, 22 These two women with their neat shirtwaists and aprons are fair types of the girls who have learned in Domestic Art classes to sew and to have their clothes neat and well-fitting. Farm women used to be so isolated they were careless in dress or did

know how to fertilize correctly and to plow to the right

179 The ground must be harrowed and then planted. In Ar this is done by farm machinery.

357, 147, 199 On smaller fields the reaper and binder will with good effect; the grain will be stacked up and late to the barns to be threshed.

218 The combined reaper and binder will be used on large fiel leaves the straw in the fields to be plowed under to e land.

177 This thresher is piling up the straw which probably w turned to the land.

147 Oats are raised, harvested and threshed just as wheat. the crop is consumed on the farm as food for cattle.

149, 166, 184, 198 Celery, potatoes, corn, beets, etc., must be c to keep them clear from weeds. This can be done (105, 419) where labor is cheap.

198 The cultivator drawn by horses is commonly used in th States.

527 to 529 From the Japanese could well be learned the less finite pains. It is only by the most careful methods t country is able to maintain so great a population.

549, 550 The Filipinos use the most primitive tools and m their work.

104 Raising rice in America is different, for here the work some slight engineering as well as agriculture. Field flooded and drained several times before the rice is ri

105 In most places this work is done with a cultivator drawn

184 Corn was unknown to the civilized world before ground must be carefully prepared and later cultiv corn is to do well.

137 Pumpkins are very commonly planted with the corn.

[illegible] is ripe, it is cut, the ears are husked

and there are always animals to be killed for meat. Mutton and lamb always bring a good price.

159, 356 No farm is complete without cows to furnish milk and butter.

57, 403 Cows must be kept clean, people who handle the milk must be very clean and all the utensils used in caring for milk must be immaculate. Milk dishes must be washed and scalded each time they are used.

56 Almost every farm has chickens. To be really profitable chickens must be especially cared for.

44 No farm is complete without fruit. Today fruit trees must be sprayed to keep them healthy. One neglectful farmer can infect a whole district.

175 Good apples, carefully picked and packed, always find a market. Trees must be pruned and kept in good shape in order to yield good fruit.

85 Peach trees demand care but they repay it.

236, 237 This orange grove and vineyard show the ground cultivated and kept clear from grass and weeds. Vines, like trees, must be carefully pruned and sprayed.

108 In Florida fruit raising and market gardening are the chief occupations.

MAPLE SUGAR

130 The maple sugar season is confined to a few days in early spring when the sap first flows from the roots up through the trees. During this short time the work is fast and furious for the sap flows day and night and must be boiled. Almost every farm could have enough maple trees to make its own supply of maple syrup and sugar.

STOCK RAISING

Stock raising is an important local industry on the Western plains which are too dry to be farmed without irrigation. Farther east it is a local industry near business centers where the produce can find ready market. While every farm has some horses and cows, some farms make a business of raising certain kinds of stock.

a. Horses

138 Percheron horses are heavy draft horses, especially suited to farm work.

398 Belgian draft horses are big horses for heavy work. Both Percheron and Belgian draft horses are very carefully reared.

188 On our Western plains are great ranches where horses are half wild with very little care in raising. These horses have great speed and endurance.

b. Cattle

The kind of cattle a man raises will depend upon what he wants from them.

364 Jersey cattle give rich milk but they are not good beef cattle. They are raised where butter is wanted.

371 Ayrshire cows give a great quantity of milk not so rich as the milk of the Jersey. Ayrshire cows are good ones for a milkman to keep.

159, 165 Holstein cattle are good for general farm purposes. They give a great quantity of milk, moderately rich in butter fats, and they are, besides, good beef cattle.

185, 358, 370 Hereford and Aberdeen Angus cattle are especially good beef cattle. A successful farmer must know what kind of cattle he wants and how to care for them so as to get the largest profit.

127, 186 On the great ranches of the plains, cattle roam almost at will till they are ready to be shipped to market.

140 These are cattle from the Western plains.

c. Hogs

172, 183 Hogs well fed and kept clean are almost clear gain to a farmer.

122 Too often pigs are not cared for but are allowed to act as scavengers. Such pork is not first class.

MEAT INDUSTRY

Meat packing is a local industry in such cities as Chicago, Omaha and Kansas City, railroad centers, to which supplies can be brought easily, and from which the prepared meats can be distributed quickly.

140 In an amazingly short time all these cattle will be killed and turned into meat.

141 Each carcass must be carefully washed and cleaned.

142 Backbones are split and the carcass again inspected.

143 Hams are carefully trimmed and prepared.

144 Even the trimmings of the meat are prepared for market. All these workers must be clean and the prepared meat must be inspected in order to comply with the pure food laws.

DAIRYING

Dairying is a local industry in and near almost every large city. Dairy products are especially valuable in New York, Pennsylvania, Wisconsin, Minnesota, Iowa and Illinois.

Only in recent years this type of industry has sprung up and now it embraces important branches such as cheese factories, ice-cream plants, butter factories, etc.

57 If a man wishes to sell milk in the United States, his cattle and barns must be sanitary and all the people and utensils that handle the milk must be absolutely clean.

46 Bottles must be washed and scalded, they must be filled with milk and capped, then no dust can enter in delivery. The top of the bottle should be washed before the cap is taken out.

45 All the milk of one district may be brought to one factory, the cream separated, and churned and made into packages ready for market. Creamery butter can be made under absolutely sanitary conditions. Milk from sources not clean must be refused.

LUMBERING

In Maine lumbering is one of the most important of local industries. White pine is timber most valuable there. In the central states hard wood is cut; in the northwest, Douglass fir; and in the south, yellow pine. Each locality uses methods best adapted to itself.

Lumbering is of two kinds, conservative and ordinary. The first seeks to treat the forest so that successive crops may be produced. The second takes no account of the future; it cuts only the better part of the trees, often destroying young and promising trees in so doing.

224 The great trees of our western coast were cut so recklessly they were rapidly disappearing. Conservative cutting is now being done.

1, 162 These logs in Maine and in Minnesota are taken to a stream where they can be floated down to the sawmill. This is hard and dangerous work.

215 Log drivers see that these rafts do not jam. They must keep the rafts free and moving. This too is dangerous work.

216 In the sawmills the logs are cut into lumber by great circular saws.

TRANSPORTATION

Communication is now a universal requirement. No place is able to live independently in this age. Yet so tremendous an industry can never be managed as a unit. It is divided and subdivided. Railroads are operated in divisions and divisions in sections. So in its operation transportation becomes a local industry, the men working on the part of the route near where they live.

43, 128, 129, 157 Every community gives some of its young people to the railroads. At least four men are necessary to run each train, two skilled workers and two unskilled. The conductor and engineer have a constant mindfulness of orders, watchfulness of signals, of the track and of the train. These are positions of great responsibility. Firemen must keep up steam and brakemen give signals, couple and uncouple cars and do other train work.

26, 52, 242 Great numbers of men find work on ships. The old time sailor of romance is fast being replaced with stokers, engineers and all the mechanics needed for steamships run by engines instead of sails.

25 New York; 248 City of Panama; 295 Havana, Cuba; 314 Buenos Ayres; 347 Liverpool; 429 Marseilles, France; 433 Barcelona, Spain; 525 Fuji-Yama, Japan; 556 Algiers, Algeria. The sailor's life, probably giving the least personal liberty, will always have the attraction of permitting one to see the world.

NOTE: Keystone prepared the first series of stereographs and slides to show in an adequate way something of the story of our great industries. This collection has been added to regularly and is unusually complete. Our General Catalog containing our list of industrial subjects will be mailed free of cost upon request.

THE PUBLISHERS.

40. HYGIENE — HEALTH HABITS

By MICHAEL VINCENT O'SHEA, B.L.

PROFESSOR OF EDUCATION, UNIVERSITY OF WISCONSIN

Vigorous health is one of life's greatest blessings. We should guard it as one of our chiefest treasures. Not only should we zealously care for the store of good health that we now possess but we should seek by every means to add daily to our healthful vigor.

Much can be done by the earnest teacher for the health of the pupils in her care. Stimulating suggestions as to health habits are naturally given by all progressive instructors. This set of stereographs and slides can be made the basis of many interesting and helpful lessons of this topic. Visualizing the work will make it impressive and will fix resolves more firmly than is possible with description only.

1. OUT-OF-DOORS LIFE

224 Oregon woods. Life in the woods will develop vigor and hardihood.

72 The daisy pole. Everyone ought to live and play out-of-doors in the summer time.

60 Atlantic City. Bathing and swimming are the best forms of relaxation and physical exercise.

83 School garden. Every child in the city should have work in a garden in the summer.

102, 221, 228 United States; 441, 445, 448 Switzerland; 508 India; 367, 369 Scotland; 344, 345, 346 Antarctic; 377, 382 Ireland; 388 Germany. The purest and most invigorating air is found in mountainous sections. People who live in rugged countries are apt to develop vigorous health if they have food and clothing enough and good shelter.

221 Mt. Hood. The great mountainous regions of the West furnish means of restoring health and vitality to the people who live in cities.

127, 188 Cowboys. Ranch life on the great plains develops energy and endurance.

136, 233, 160, 178, 179, 181, 218 Farm lands, United States. The mod-

ern farmer should be the healthiest of men since he lives in the great outdoors and machines will do his heaviest work.

II. HEALTH HABITS IN REGARD TO WORK

40 Linen collars; 41 Shoe factory. People who sit at their work should have frequent opportunity for brief intermissions to stand and move about, or they will lose their health.

62, 65, 66, 67 Iron and steel; 68 Coke; 134 Glass; 156 Copper; 334 Silver. People who work in metal foundries should have short hours and be protected from the extreme heat.

69 Oil well. Those who work with explosives are under strain constantly, and they should have very short hours with the best physical conditions.

74, 75, 76, 77 Coal; 155 Copper. Workers in mines are usually undersized and in a low state of health because of lacking light and air and of breathing dust. Miners should have short hours because their work is so hard and unhygienic.

135 Work in glass is very trying to health.

272 The tanning business is injurious to health unless the hours of labor are short and the ventilation very good.

111 Sponge market. Those who work in the water much of the time are likely to suffer with congestion in the respiratory organs because they are not properly protected.

21 Jewelry; 11 Shoes; 15 Printing cloth. People who do finely coordinated work should have frequent relaxation to prevent nervous strain.

III. HEALTH IN REGARD TO FOOD AND DRINK

44, 175 Apples are necessary in everyone's diet, but they must be protected from insect diseases.

47 Cantaloupes are a valuable addition to one's dietary.

85 Peaches are a valuable adjunct to one's dietary.

108 Pineapples furnish acids which are very useful in digestion.

236 California; 390 Germany; 319 Argentina. Grapes when used fresh or as raisins are superior food. When used for wine their value is lost. Wherever many grapes are raised for wine, people will be underfed and over stimulated.

237, 437 Oranges. One could not over-state the value of ripe oranges in one's dietary.

294 Harvesting bananas. When thoroughly ripened they are luscious and nutritious.

551 Husking coconuts. They contain milk and meat that are nutritious.

234 Almonds. Nuts of all kinds make delicious and nutritious food.

118 Harvesting peanuts. They furnish fine food when roasted or made into peanut butter.

166 Potato digging machines. Potatoes grown in a sandy region make a necessary and delicious food.

149 Celery and similar foods must be washed very carefully.
198 Beets make a very wholesome food, and should be used freely.
104, 105 United States; 527, 528, 529 Japan; 550 Philippines. Rice constitutes the principal food of many millions of the human race.
479 Greece; 488 Russia; 506 India; 516, 518, 522 China; 529 Japan; 543 Chosen; 549 Philippines; 561, 562, 563 Egypt. People who use primitive methods in agriculture and other industries must devote most of their energy to getting food enough to sustain life.
199, 218, 357 Wheat. Bread and cereals made from the whole kernel of wheat contain all the elements for perfect nutrition.
498 Palestine. People who live on bread made of the whole grain ground in a rather coarse way have better health than those who live on fine sifted white flour, with nothing but the starch left in it.
56 Eggs laid by well-fed and well-cared-for hens make an ideal food, for the young especially.
357 Wheat; 358 Cattle. Grains furnish a better and cheaper food than beef, as a rule.
141, 142, 143, 144 Packing houses. The greatest care must be taken with flesh food to avoid disease.
46, 57, 159, 165, 411, 413 Dairying. In order to secure pure, clean, wholesome milk cows must be well cared for and have fresh air and wholesome food. Serious diseases are due to unclean milk.
166 Potato; 105 Rice; 140 Cattle. It would be better in every way for most people in American life if they ate more of vegetables and less of animal food.
34, 35, 258, 270, 271, 333 Sugar used in moderation is wholesome. Used in excess it is the cause of many disorders.
130 Maple sugar is an excellent food if used sparingly. When used too generously it overtaxes the system.
295, 310, 311, 468 Coffee contains a drug and most people would be better off without it.
373, 530 Tea. Much tea drinking means weakened vitality. Tea is a menace to health.
303 Cocoa makes a much better beverage than tea or coffee when used sparingly. If used excessively it is very harmful.
285 Pulque. Any kind of intoxicating beverage is a poison in the system.
297, 112 Tobacco is harmful and everyone would have better health and vigor if he would let it alone.

IV. HEARING

12 Shoes; 54 Silk; 82 Locomotive shop. People who work in very noisy factories lose keenness of hearing sooner or later.

V. BREATHING

3 Granite; 5 Marble. Care must be taken not to inhale rock dust, which is very irritating to the lungs and mucous membranes.

177 Threshing, North Dakota. In up-to-date threshing men do not have to inhale dust as they did in an older day.

26 New York; 61 Pittsburgh. Where the smoke nuisance is not abated, people may suffer with nasal and lung difficulties.

17 Woolen mill; 19 Paper mill. People who work in wool or cotton or rags which are not clean often suffer from respiratory diseases.

76 Dust from coal may injure the lungs.

67 Sawing steel, small particles of iron or steel such as filings or dust from grinding machines may also cause lung trouble.

VI. HEALTH HABITS IN REGARD TO AIR AND LIGHT

204, 263, 265 Indians. They had one advantage over people of culture — they had fresh air constantly.

113 Lincoln cabin. People who live in log huts usually have an abundance of fresh air.

279 Labrador. Life in cold regions develops vigor and endurance if one has food and clothing enough.

103 South Carolina. In sections in which much charcoal is burned there are always gases which interfere with health.

93 Washington, D. C.; 126 The Alamo Plaza. A city cannot be a healthful place unless it has many trees, wide streets, and is free from smoke and dust. All cities should have many open places for relaxation and fresh air as well as for beauty.

336 Ecuador. Children who do not have opportunity to play out-of-doors on grass never develop properly.

6 Boston tenement. Children who grow up in narrow streets can never develop properly.

30 New York City. In some streets in crowded cities sunlight never enters. In this street it enters with difficulty.

25 New York City. The time will come when the tops of buildings in large cities will be used for playgrounds and recreation, especially for children.

58 Pottery, N. J. Those who work in unventilated, unlighted work rooms cannot preserve their health.

16, 18, 24, 94 Every factory should have an abundance of light and air.

11 Shoe manufacture. A worker's light should come from above, not directly in front.

VII. FATIGUE

178, 179, 180, 181 Farm machinery. Farmers should get machines to do the heavy work of the farm so far as possible.

162 Hauling logs, Minnesota. Working with logs uses up much energy. Workmen should be well fed and well housed.

84 Mint; 94 Engraving and printing; 152 Ford plant. These employees work but 8 hours per day, hence have time for recreation to overcome the fatigue from their work.

181 Harvesting alfalfa; 147 Oats. Farmers at harvest time work long hours but work in the open air gives less fatigue than the same hours and work indoors.

VIII. CLEANLINESS

120, 161 Ditching swamp land tends to breed germ diseases. It should be ditched and drained.

7 Boston; 393 Germany; 395 Belgium; 555 Morocco; 572 British East Africa; 481, 485 Russia. Much disease is spread in communities through dirty, unsanitary markets. Markets like these are almost sure to spread disease among those who patronize them.

13, 244, 226, 227 Fish. Disease is often spread when care is not taken to keep fish clean.

35 Sugar; 45 Butter. The food here is handled with care, but in some food factories little care is taken to keep the food clean, so people suffer with digestive difficulties, not knowing what the trouble is.

86 Oysters. Serious diseases are often spread by lack of cleanliness in preparing and shipping oysters.

292 Tortillas. Uncleanliness in preparing food is the cause of numberless disorders.

572 Africa; 341 Venezuela. Much disease is spread by dirty methods in storing and handling goods.

32 Ellis Island. Serious germ diseases are often brought to our shores from foreign lands where the habits of the people are unclean.

431 France. Disease germs cannot be removed from clothing except by boiling. Washing in a river cannot make clothes healthful.

501 Ganges River, India. Plagues always follow unclean practices such as shown in this picture.

438 Spain. Dusty roads are always a source of disease.

455 Sicily. People who live in dirt and squalor are never well. Cities must be kept scrupulously clean in order to insure health.

474 Constantinople, Turkey. Animals kept on city streets tend to pollute the atmosphere.

503 Delhi, India. It is well to remember that contagious diseases readily spread in crowds.

NOTE: The Keystone View Company's General Catalog presents a list of many thousands of stereographs and lantern slides. Especial emphasis is placed on the complete series dealing with our great industries. There is also a full list of Travel Tours and miscellaneous subjects. This General Catalog is sent free upon request.

THE PUBLISHERS.

FINE ARTS

INTRODUCTION

By C. VALENTINE KIRBY

DIRECTOR OF ART EDUCATION, PITTSBURG PUBLIC SCHOOLS

Ours has been understood to be a commercial age, dependent upon the heritage of the past for those things we have generally regarded as works of art. Today, however, even the casual observer must be impressed with the significance of "art" in various phases of our daily life and work. Our homes with their furnishings are becoming objects of real beauty and comfort, the veritable expression of beauty by their makers. Our manufactured products are being refined (and consequently enhanced in value) by a greater charm of line, form and color. Our schools are producing our own designers of these products and freeing us from a foreign dependency. Our places of business, our shop windows, our advertising are today examples of real artistic expression. We are learning to express ourselves in our dress and make it more appropriate and generally charming.

This growing desire for beauty is being expressed collectively in the improved city and township working for the best in town planning and civic beauty. Behold! Art has not been lost — it is merely taking on new forms. It has been democratized. We have at last obeyed Victor Hugo's injunction, "Away with Art for Art's sake, and give me Art for Humanity's sake."

Art has ever been found to be the basis for national wealth on the one hand, and true spiritual uplift on the other. The nations with tasteful skill have controlled the markets of the world. The man who can either produce or enjoy true works of art lives in the higher realms above the sordidness and vulgarity about him.

It is plain that our age requires and demands that all will love beauty and many will express it. The best place to inculcate this love both for appreciation's sake and for expression's sake is in the school room. Drawing and sketching, however, have always been limited to objects that could be brought into or seen from the school room. This is especially true in cities and the field for such study has been very narrow. The stereograph has changed this. With the pupil's eyes in the stereoscope, the classroom shut out, the scene in proper perspective, all forms correctly represented, outdoor sketching from nature becomes an indoor exercise possible in every schoolroom.

The lantern slides offer even more attractive possibilities since the entire class is able to see the same view. With the latest Mazda lanterns a scene may be held on the screen without breaking the slides. Also this lantern can be used under daylight conditions with merely the window blinds drawn.

These methods give the opportunity for careful study of nature which must be stimulating in its effect. They create an environment of unusual charm and rare opportunity; they greatly enlarge the field of education in art.

In order to contribute to these needs and facilitate this work, there has been assembled from our "600 Set" of views the following group:

1. Drawing — study of pictures to show elements of art.
2. House Design and Decoration; Costume Design.
3. Photography.
   Also see classification Cities of the World.

These give the opportunity for careful study of elements that must be stimulating in their effect, creating, as they do, an environment of unusual charm and rare opportunity.

41. DRAWING — STUDY OF STEREOGRAPHS AND SLIDES TO SHOW ELEMENTS OF ART

By HARRY W. JACOBS

DIRECTOR ART INSTRUCTION, PUBLIC SCHOOLS, BUFFALO, N. Y.

The following views have been selected to give classes in Drawing a practical view point in the subject of perspective and drawing in general. The views have been subdivided into sections with definite points of study, which will be of special interest to the student, classroom teacher and drawing supervisor.

STUDY OF CIRCLE IN PERSPECTIVE

14 Cotton mill — circles seen with axis vertical and at angle to picture plane.
18 Woolen mill — circle seen with axis vertical and at an angle to picture plane.
20 Paper mill — circles seen at an angle to the observer.
23 Silk industry — showing convergence of circles in perspective.
33 Dining table with plates in perspective below eye level.
45 Revolving churn — an excellent example of circles seen obliquely.
48 Erie canal — study of circle below the eye level in perspective.
58 Firing tableware — showing circles with axis at various angles to picture plane.
59 Artists decorating porcelain ware — circles with vertical axis at parallel to picture plane.
65 Filling molds — circles in perspective above and below eye level.
64 Pig iron machine — circles seen obliquely.
66 Steel works — showing circles at an angle to picture plane.
73 Cannon — showing circles at an angle to picture plane.
80 Liberty Bell — circles above and below eye level.
82 Baldwin Locomotive Works — showing axis of circles at angle to picture plane.
84 Government mint — circles seen below the eye level in perspective.
87 Dome of capitol — showing circle in perspective above eye level.
88 The House of Representatives — the wide sweep of the seats showing the circle in perspective below the eye level.
123 Oil tanks — circles seen below and on the eye level.

124 Old wagons — showing axis of wheels at angle to observer.
132 Automobile tire factory — showing axis of circles at angle to observer.
153 Packing salt — axis of barrels are seen obliquely.
162 Logs of various lengths seen obliquely.
171 Large generators — showing circle in perspective below eye level.
175 Barrels — showing axis of ellipses at angle to observer.
180 Wheels on large tractor — show circle seen obliquely.
203 Stamp mill — showing circle seen obliquely.
241 San Gabriel Mission — bells above the eye level.
286 Carding room — showing circles in perspective with axis seen obliquely.
296 Turret of wrecked battleship *Maine* above level of eye.
320 Old cart and gig — wheels at angle to picture plane.
332 Preparing soil — showing circles at angle to observer.
378 Large heavy cart wheels — seen at angle to observer.
396 Quaint cart — with wheels at angle to observer.
412 Norway — circular blocks of wood showing circles seen at many angles to observer.
452 Coliseum — showing circle seen above and below eye level.
454 Naples — carts with axis of wheels at angle to observer.
484 Bell market, Russia — bells of various sizes seen below the eye level.
493 Damascus — circular shaped roofs in perspective below eye level.
498 Palestine — circular shaped vessels in perspective below eye level.
502 The Taj Mahal — showing circle in perspective above the eye level — eye level very pronounced.
530 Basket and Japanese hat in perspective above eye level.
563 Large spinning wheels seen at an angle to picture plane.

PARALLEL PERSPECTIVE

Subjects Parallel to the Picture Plane

6 Old North Church — a convincing illustration of dominant surfaces parallel to the picture plane.
9 Longfellow's home — path leading to the home a good example of parallel perspective.
11 Shoe factory — the long benches offering excellent example of parallel perspective.
14 Cotton mill — long lines of textile machines vanishing at one point on eye level.
24 Silk industry — showing all lines leading to one vanishing point.
25 From Woolworth Tower — tall buildings below the eye level.
29 Wall Street — showing dominant surfaces parallel to picture plane.
30 Broadway, N. Y. — dominant surfaces parallel to picture plane.
42 Salt works — excellent example of parallel perspective.
43 Railroad tracks with cars and surrounding landscape give a good example of parallel perspective.
63 Pig iron machine — a very pronounced example of parallel perspective.

79 Shipping coal — large coal cars leading to good interest point.
91 Portico of White House an example of parallel perspective.
128 Ore docks — most interesting example of parallel perspective.
133 Racks holding boots parallel to the picture plane.
139 State Street, Chicago — dominant surfaces parallel to picture plane.
149 Long rows of celery converging to one vanishing point.
167 Dominant surface in street scene parallel to picture plane.
174 Dominant surface of Eads Bridge parallel to picture plane.
237 Orange groves — showing retreating lines parallel to the picture plane, vanishing to one point on the eye level.
286 Carding room — a pronounced example of parallel perspective.
331 Showing narrow street — dominant surfaces parallel to picture plane.
336 Street in Ecuador — example of parallel perspective.
340 Large buildings — converging to one point in eye level.
352 Illustration of dominant surfaces parallel to picture plane.
381 Belfast, Ireland — illustration of dominant surfaces parallel to picture plane.
402 Picturesque Holland street scene in parallel perspective.
460 Innsbruck, Austria — showing dominant surfaces parallel to picture plane.
500 An excellent example of parallel perspective.
502 Walk leading to the Taj Mahal — a good example of parallel perspective.
573 Mombasa, Africa — an old street in parallel perspective.

ANGULAR PERSPECTIVE

Subjects at an Angle to the Picture Plane

7 Showing Faneuil Hall and market wagons in angular perspective.
8 Old State House, Boston — an excellent example of angular perspective.
19 Large boxes below eye level and at angle to picture plane.
27 Brooklyn Bridge and surroundings — an example of angular perspective.
28 Tall and low buildings above and below the eye level.
33 House interior — showing examples of angular perspective.
34 Trays of loaf sugar — showing many small cubes in angular perspective.
37 Washington's headquarters — an out-of-door illustration of angular perspective.
87 The Capitol — combining the circle seen in perspective with angular perspective.
89 Showing chairs and tables with lines of room at angle to picture plane.
92 Cabinet room with furnishings at an angle to picture plane.
95 Congressional Library — an example of angular perspective.
96 Washington's old home — an example of angular perspective above eye level.
109 The picturesque old slave market in angular perspective.

113 Abraham Lincoln's cabin — a good example of angular perspective.
116 Angular perspective showing cars and steel furnaces in background.
124 Wagons at cotton gin in angular perspective.
157 Loading copper — an example of angular perspective.
170 Great power dam and houses in foreground in angular perspective.
176 Many tall and narrow buildings illustrating angular perspective.
214 A group of houses below the eye level in angular perspective.
241 The old Mission Wall — an example of angular perspective.
281 Home of the peon — illustrating angular perspective.
305 Dominant surfaces at an angle to picture plane.
310 Old house in Brazil — example of angular perspective.
320 Old cart with house in background in angular perspective.
354 Birthplace of William Shakespeare — example of angular perspective.
355 Anne Hathaway's cottage seen in angular perspective.
365 Edinburgh — dominant surfaces at angle to picture plane.
368 Wallace Monument — illustration of angular perspective above and below eye level.
372 Burns' cottage — an interesting interior in angular perspective.
373 A picturesque old Highland home showing angular perspective.
376 Blarney Castle — fine example of angular perspective.
399 Quaint Holland houses in angular perspective.
425 Notre Dame — leading lines of building and foreground an excellent example of angular perspective above and below eye level.
429 The Cathedral, Marseilles — many examples of angular perspective.
461 Public square — dominant surfaces at angle to picture plane.
473 Constantinople — many interesting examples of angular perspective.
524 An old gateway in angular perspective.
533 Japanese bed — an interesting interior in angular perspective.
536 Silkworm incubator — an excellent example of angular perspective.
557 An old gate illustrating angular perspective.

POSTER DRAWING

The following views may be used in poster work. They show good mass arrangement and may be well arranged in drawing and with lettering applied as needed to be used as a commercial advertisement. This selection of views is particularly adapted to classes in commercial poster work.

6 Old North Church — material for a travel or historic poster.
7 Boston, Mass.— material for a travel poster.
8 Old State House, Boston — a historic poster or post card.
9 Longfellow's home — an excellent example of simple masses for a historic poster.
27 The great Brooklyn Bridge — a strong example of a large mass with interesting surroundings.

28 Old and new city halls, New York City — material for the development of a post card or poster.
29 Wall Street — a good example of material for a travel poster.
30 Up Broadway — poster for New York City.
37 Newburgh on the Hudson — material for a travel poster — strong contrasts shown.
42 Mouth of Erie canal — material for an industrial poster.
174 Eads Bridge, St. Louis — a poster advertising a city or railroad — showing strong contrasts.
195 Rocky Mountain divide — material for a travel poster or book cover advertising Yellowstone Park.
241 San Gabriel Mission — excellent material for a travel poster or post card.
276 Mt. Sir Donald — shows strong contrast for poster work.
335 Famous Copacabana church, Bolivia — an excellent travel poster.
425 Notre Dame — large masses with interesting surroundings for poster work.
460 Maria Theresa Platz, Innsbruck, Austria — interesting background with large masses in foreground giving excellent material.

PENCIL, PEN OR CHARCOAL SKETCHES FROM PHOTOGRAPHS TO DEVELOP TECHNIQUE

The student should select a print and make a drawing of it, using any of the above mentioned mediums. All sketches should be thoroughly thought out, having eye level and vanishing points located. This drawing should be followed by completing in light and shade a similar drawing, using one of the mediums mentioned.

6 Old North Church — showing an excellent center of interest in sunlight — shadows in foreground.
7 Quincy Market — excellent illustrations of mass arrangement.
8 Old State House — a good example for pencil technique.
9 Longfellow's home — showing strong contrasts of light and dark.
27 Brooklyn Bridge — a good example for pen, charcoal or pencil.
28 New York City — showing strong mass arrangements.
29 Wall Street — an example for pen, charcoal or pencil.
30 Up Broadway — broad masses are well illustrated in this picture.
37 Washington's headquarters — a good subject for pencil or pen.
48 Mouth of Erie canal — a subject for pencil technique.
109 Old slave market — an excellent example for pen and ink or pencil rendering.
174 Eads Bridge — good subject for charcoal drawing.
241 San Gabriel Mission — shows broad mass arrangement.
281 Home of peon — excellent example for pen and ink or pencil drawing.
320 The high cart and gig — a subject for pencil drawing.
354 Birthplace of William Shakespeare — material for pencil or pen and ink rendering.
372 Burns' cottage — an excellent pencil interior.
373 Highland home — good example of contrasts for pencil handling.

376 Blarney Castle — good example for pencil or charcoal mediums.
399 Quaint Holland houses offering examples for pencil drawing.
402 Quaint Holland street — excellent pencil subject.
425 Notre Dame — subject gives strong contrasting masses for charcoal.
461 Gratz, Austria — showing many examples for pencil drawing.
473 Constantinople — excellent material for many pencil sketches.

Nature

The following views may be used as suggestions for design motifs and for nature drawing. For a more extensive list of subjects see Nature Study group.

238 Orange blossoms and fruit; 235 Spineless cactus; 236 Tokay grapes; 249 Palm trees; 293 Mangoes.

Trees and Landscapes

38 Exceptional view — rolling hills, Hudson River Valley.
70 Trees in foreground with mass of trees in background.
71 Elm trees — shown in mass.
95 Trees below the eye level.
192 Trees stripped of their foliage.
259 Papaya and palm trees in Mauna Loa Valley.
362 Low shrubbery and excellent tree masses.
376 Trees beautifying the center of interest.
10 Old elms; 73 Trees on hilltop; 173 Trees in fall; 195, 591 Pine trees; 229 Monarch of trees; 234 Almond trees; 566, 564, 574 Palm trees; 359 Various leaf forms; 444, 534 Trees in blossom.

Figures in Action

98 Indians in costume in pantomime act.
99 Life saving corps in action — excellent examples of various running positions.
107 An excellent example of figure bending forward.
115 Mining phosphate — a good example of how angular lines denote action.
117 Figures in various positions picking cotton.
108 Harvesting pineapples — farm hands in various action positions.
168 "Brought forth food" — excellent pose for Indian drawing.
258 Cutting sugar cane — figures showing excellent action.
290 Mexican musicians and dancing girls in national costume.
295 Figures loading coffee — strong in action.
366 Highlanders at great Forth Bridge, Queensferry, Scotland.
105 Hoeing rice; 130 Tapping sugar maple; 147 Loading oats; 152 Walking; 153 Shoveling; 158 Indians in action; 169 Indians in canoe; 263 Indians weaving baskets; 224 Felling tree; 266 Troops marching; 292 Making bread; 516 Hauling roller; 523 Sawing timbers; 528 Planting rice; 529 Harvesting rice; 550 Hulling rice; 551 Husking coconuts; 552, 570 Stripping trees; 565 Egyptian figures on camel.

Boats — Ships

26 Ferry boat; 27 Sailing vessel; 48 Lake boats; 52 Ocean liners; 100 United States war ships; 106 Schooners; 119 River boats; 154 Canal boats; 253 Large transport vessels; 254 *U. S. S. Missouri;* 280 Vessels in port; 313 Dredge; 415 Whale boat; 430 Small craft; 511 Native boats; 525 Japanese boats.

Animals

110 Alligator; 232 Bison; 565 Camel; 140 Cattle in stockyards; 159, 165 Holstein cattle; 185, 358 Hereford cattle; 339 Cow and calf; 356 Cows in profile; 364 Jersey cattle; 370 Aberdeen Angus cattle; 371 Cow — side view; 403 Milking cows; 454 Horse and ox team; 510, 548 Humped cattle; 127, 186, 301, 317, 589 Range cattle; 246 Dog team; 396 Belgium dog; 340 Donkey in action; 509, 505 Elephants; 189 Elk; 136, 147, 198 Teams of horses; 494 Saddle horses; 138, 398 Excellent horses; 188 Bronco with cowboy; 182 Horses in action; 588 Kangaroos; 335 Liama; 2 Moose; 239 Ostriches; 345 Seal; 173, 190, 480 Sheep.

Indian Costume

The following views may be used in Indian illustrations and the study of Indian costumes.

98 Pocahontas pleading for life of John Smith.
158 "Nursed the Little Hiawatha."
168 "Brought forth food and set before them."
169 "From the wigwam he departed."
182 Mounted Sioux Indians in "full feather" leaving camp.
204 Ute Indian and family, Colorado.
263 Indian basket weaving, Prince Edward Island, Canada.
265 Iroquois Indians, Quebec, Can.
328 Indians on the Straits of Magellan, Chile.

See also classification on Costume Design.

NOTE: Our General Catalog comprises a list of thousands of stereographs and lantern slides dealing with the Industrial Sets, Historical series, Travel Tours and miscellaneous subjects. It will be sent free of cost upon request.

THE PUBLISHERS.

42. HOUSE DESIGN AND DECORATION; COSTUME DESIGN

By MARY J. QUINN

SUPERVISOR OF DESIGN, PRATT INSTITUTE, BROOKLYN, N. Y.

I. HOUSE DESIGN AND DECORATION

No child can be taught anything more important than the art of home making and it is easier to have a good home where the house is beautiful to the eye and arranged in the most convenient manner. Too many women work in houses so arranged that to do the necessary things takes all the time and energy, leaving none or very little for self-improvement.

So houses should be studied and children should be taught to judge what is best in a given circumstance.

So, too, in furniture and clothes. If children look at these from the standpoint of beauty and use, if they see the differences of time and nationality, surely they will acquire broader and better ideas and will no longer slavishly follow a prevailing fashion. A little start in such matters nearly always leads to great development. A large part of the crudities in buildings, in furniture and in dress come from real ignorance instead of essential lack of taste.

HOUSE DESIGN AND DECORATION

96, 298 Home is the place where the family life centers, the heart of a civilization.

10, 373, 535 But in its construction, its living arrangements, and in appearance it differs according to the climate, the environment, and the habits of life.

126, 249, 255, 306 For instance, in semitropical countries it is necessary to build for protection from the sun and the heat. There are wide piazzas, roofed porticoes, as in Italy and parts of South America.

9, 354, 355, 372, 373, 411 In colder countries, the house is closely built to protect from the cold. There are chimneys and open fireplaces, and well built windows to catch sunlight, as in Northern Europe and America.

442, 445, 447 In mountain countries, as in Switzerland, where snows are heavy, the roofs are slanting to shed the snows, and firmly constructed with reinforcements to withstand the winds, which sweep through the valleys.

492, 499, 558 In warm climates, the roofs are more frequently flat.

1, 9, 10, 124, 236, 418 In countries where there are great forests, wood is used for building material.

29, 90, 349, 425, 565, 568 In countries with marble and stone quarries, stone construction is common.

336, 337, 341 Stucco is used in warm climates.

281, 292, 339, 550 The habits of living influence the construction and arrangement of houses.

282, 493 In southern countries where people live out of doors during many months of the year, the houses are dark, cool places used mostly for dining and sleeping quarters.

33 In northern countries, where most life is spent indoors, attention is given to the comfortable arrangement of the interiors.

549, 550 Among primitive peoples, the houses furnish only the bare necessity of protection from the weather.

91, 384, 432, 476 In rich countries with courts of great wealth and splendor of living, the palaces represent the wealth, power and taste of the ruling classes.

9, 10 In New England, the austere habits of life are reflected in the fine simple proportions and arrangements of the colonial architecture.

533 In Japan, where habits of life are prescribed by artistic simplicity, the houses are beautifully clear of bric-a-brac and unnecessary furnishings.

25, 30, 61, 139 In great modern cities where people are crowded in a small area, tall buildings, apartment houses and tenements are the result of the high cost of land and the need to live within the city area.

28, 385, 422 In countries with modern standards of civilization, sanitation makes for clean streets and orderly arrangements of living.

454, 455, 474, 487, 491, 555 In older and less progressive communities, these matters are neglected — to the detriment of health and comfort of the people.

372 Before fireplaces were built, there was an open fire in the center of the great hall or living room, with an opening in the roof for the escape of smoke. Later the great fireplaces were the only means of heating the houses. There are many stories of the hiding and escape of prisoners through the large chimneys.

9, 10, 96 In the 18th century, much attention was given to architec-

tural details of houses. Beautiful doorways and windows were built and the inside woodwork and the mantels were often of elegant design. Our colonial houses in New England and the South are examples of this period in America.

33 It was not until the 18th century that the many rooms of the house as we now know it were built. Drawing rooms, living rooms, bedrooms, dining rooms and kitchen were included in the plan of the house. With the decline of taste in the 19th century all sorts of architectural monstrosities were built. Houses with two or three kinds of roof constructions and windows, and with towers and ugly porches decorated with fret work, were built.

But for the past ten or fifteen years, a new era of domestic architecture has replaced the ugly houses of 1870–'80–'90 with well arranged and well proportioned types of houses which have some claim to beauty.

37, 96 Simple forms are always better in domestic architecture than are elaborate and overdecorated styles. A house should be built to conform with its surroundings.

354 The gabled roof with casement windows require much decorative planting of trees and shrubs to make them a part of their surroundings.

10, 96 The houses of Colonial type and those with simple vertical and horizontal lines are likely to prove more beautiful and livable than more varied styles.

Fortunately today, much attention is paid to the sanitation and the economic arrangement of rooms. A large kitchen, for instance, is a waste of space in the average house. It wastes the energy of the person who is to work in it. The limited space in apartment houses of large cities requires a very economic arrangement of rooms.

This is the golden era of the home. The architect who builds it, the artist who decorates it, and the homemaker who decides what is necessary and useful, all bring to bear the essential points of view to make a beautiful and practical home.

373, 409, 443 Peasant furniture all over the world is similar in type. Crude strong construction and simple lines characterize it.

92, 417 The furniture of palaces and homes of the wealthy is more elaborate, often heavily carved, and gilded, representing the finest workmanship of the time.

292, 533 In tropical and eastern countries where people live out-of-doors, there are only the necessary pieces of furniture made simple or elegant according to the class of the people.

33 In Western Europe and America where people live more indoors, many more pieces of furniture to fit the needs of modern living are used.

During the middle and latter part of the 18th Century, often called the Victorian period, the decline in taste was reflected in the furnishings of the homes. The furniture was usually

ornate, the wall papers and carpets overdecorated, and useless bric-a-brac and elaborate lace curtains and draperies were used. In the last ten years the reaction from this period of bad taste began with the introduction of the simple sturdy designs of Mission furniture. The result of study in interior decoration and the application of art to furnishing shows results in the fine taste that is being exercised in house furnishing. The influence of the simplicity and art of the Japanese in their houses has also had an effect in making us realize the beauty of empty spaces and fine arrangements.

33, 92 In planning the furnishing of a house, the needs of each room should be carefully considered. The furniture should be selected with reference to its use, its good proportions and lines, and placed so that there is a balanced arrangement in the room. The furnishings throughout a house should be similar in type. A color scheme including very few variations will always be more restful and effective than a great variety of inharmonious colors. The spacing and arrangement of the furniture and of pictures, if carefully considered, will avoid the effect of disorder which comes from overcrowding.

African (Central)

572 These buildings were constructed by the European commercial agents. The natives live in huts built of poles and branches with roofs of grasses and branches.

573 Arabian influence is shown in the barred window gratings and high balconies.

575 Portable houses are built which can be packed and shipped in sections for European agents living in Africa.

Australian Modern

586, 590 The houses in Australian cities are similar to those of Great Britain.

Austria

460 In all European cities apartments are built over the shops. The shutters are hung to protect from the sun without closing out the air.

461 Steep sloping roofs with dormer windows show German Gothic influence.

462 This shows the regular apartment houses of modern European cities.

Asia Minor

493 Houses in the Orient have few windows in order to keep the interiors as cool as possible. The semicircular archways over the streets are built to protect from the hot sun.

497 Small windows are common in houses in hot climates.

498 The interiors of these houses are as primitive as the exteriors; usually earth or clay floors with mats to sit on — the Oriental

seldom uses a chair. The simple food is eaten from large bowls.

Ceylon

512 In all oriental countries the houses are dark and simply furnished. The family works and lives out-of-doors all day. Very few of the poorer houses have chairs or tables. Mats are laid on the earthen floors for beds and a board or a bench serves as a table.

Houses of China

In China, as in Japan, the architecture of the houses, palaces and temples has a uniformity never found in western countries. The houses are usually built around a court. They have green, yellow or brown tile roofs which slant concavely and turn up at the corners. The roofs are supported by wooden pillars which stand on stone foundations. The beams and cross beams and under the eaves are richly carved and decorated in color and gold. As one enters from the street to the court, the living apartments are on either side and at the end of the court. If the family is rich, there may be a series of courts and wings of apartments with several roofs or double roofs. Over doors and windows are open panels of rich carving. The floors are of clay or brick.

The Chinese sleep on mats with a square piece of hard woodwork lacquer for a pillow. Unlike other Asiatic peoples, the Chinese use chairs, and tables straight in line, of ebony, redwood or bamboo, sometimes decorated with geometric openwork carving. They use two long pointed sticks called chopsticks instead of knives and forks. The Chinese make beautiful lacquer chests and cabinets. Carved stands in which are placed flowering plants or dwarfed trees or shrubs are placed against the walls.

On the walls are hung long scrolls of paintings or printed quotations from their books of wisdom. Chinese paintings are very beautiful in their exquisite drawing and composition of color.

The Chinese have made beautiful porcelains for hundreds of years. The European porcelains of the 18th century — Meissen (or Dresden), English and French — were made as a result of the importations from China.

In the crowded cities of southern China, the people live huddled on boats placed as closely together as city tenements and nowhere in the world are living conditions worse than among the poorer Chinese in their crowded cities.

Chinese

513 These city buildings show European and American influence. Only the wealthier classes of Chinese merchants and the visiting foreigners have their offices here or live in these quarters. The open balconies are comfortable during the hot season.

514 Very crowded and primitive living conditions.

517 The bright colored tile and the lifted corners of the roofs give Chinese villages a picturesque appearance.

520 Over doorways and in halls and over windows, the Chinese place carved and gilded panels. Instead of window glass, paper is used for keeping out the air, but admitting the light. These little children have to sit on very straight chairs or benches.

521 Beautiful designs of carved wood used as decoration over doors and under roofs and cornices.

Chosen (Korea)

542 The winter snow covers the thatched roofs of these plaster or stone native cottages. Inside there is one large room with an earthen floor.

Denmark

404, 405 Steep roofs and dormer windows are of Gothic type.

406 City apartments in Copenhagen like those of other European cities.

Dutch

399 The interiors of these Dutch homes have a charm in their orderly simple furniture and their arrangement of the brass and copper cooking utensils. The Dutch like gay color and paint the doors and windows bright blue or green. With the red geraniums in the window boxes and the bright colored dresses of the girls, the blue trousers of the fishermen, they present a gay appearance.

400 In all European cities, people live over the shops, one floor being used by each family.

401, 402 Dutch streets are always gay. Indoors there is a large living room with a fireplace for cooking and a few small rooms adjoining and one or two sleeping rooms upstairs. The furniture, tables, chairs and benches are of simple straight design. The beds are closet beds built in the walls with curtains drawn across in front. The Anti-Tuberculosis Society is trying to abolish this type of bed. A Dutch kitchen has copper pots and pans, pewter ware, and blue and white china ranged in regular and picturesque order on racks along the wall.

Egypt

558 Alexandria is now a modern city. The houses of the wealthy and the hotels are like European houses. The poorer classes of natives live in adobe huts of one or two rooms and sleep on earthen floors.

English

Half-timbered and plaster houses with steep gables and casement windows with small leaded glass panes.

354 The walls of these 17th century houses were made of heavy timbers crudely hand-hewn from logs and fastened together by joints and wooden pegs. Between the timbers, the spaces were filled with plaster, which made both inside and outside walls. The windows had very small panes of glass leaded together, for

glass was both expensive and rare and was not made in large sheets as today. The furniture was of oak with turned legs, strongly put together with joinery and wooden pegs.

Elizabethan cottage with thatched roof, half-timbered and plaster walls and small casement windows. It was heated entirely by open fires and simple straight oak furniture was used.

355 The roofs were thatched with rye straw tied to cross rafters in bunches and laid on row over row like shingles. It is very picturesque but inflammable.

360 This shows a few houses with gabled roofs and small casement windows of merrie England.

362 Picturesque country house with casement windows, many chimneys for open fires, vine-clad walls and a beautiful garden.

French

421, 422 In Paris, the apartment houses are beautiful and well kept. On the first floor lives the concierge, or caretaker, who admits all visitors and opens the doors at night for late comers. French interiors have always been beautifully furnished.

423 The French houses of the last half of the 19th century were solidly built of brick or stone with mansard roofs.

430 These lovely villas with their orderly architecture and well arranged gardens are luxuriously furnished in the modern French style.

French Canadian

262 The comfortable clean farmhouses of Canadian French farmers have the picturesqueness of French rural cottages.

Germany

389 The old houses on this square have the steep roofs with dormer windows of medieval Gothic Germany and France.

394 Modern German houses are well built and comfortable.

Greek.

475 Modern Greek houses are similar to those of any modern Italian city.

476 This palace has the classical proportions of the Italian palaces. Indoors the great reception rooms, halls and living apartments are richly furnished in the European fashion.

Greenland

343 Houses in Greenland are primitive in their construction. The small windows are necessary in so cold a climate.

India

In all Oriental countries, little attention is given to the architecture or furnishing of the home. In India, the average house has few if any windows; these are barred to protect from thieves. The floors are of earth or clay. There is little furniture; the family usually sleeps and

Irish

376 This feudal castle was built before scientific household ment was considered. The stairways were narrow for protection against attack from an enemy. Th were small and, in the 16th century, without glass. great halls used for living and dining room a apartments.

378 As in all European cities, people live over the shops.

379 The cottage at the left is built of stone with slate windows are small, due to the high cost of glass panes in the early part of the last century. The rooms downstairs with small bedrooms upstairs rafters. The cooking is done over a large firepl hung from metal hooks and cranes. Bread and mea on hot stones in front of the fire. The large white l distance is a modern stone building of Elizabeth architecture.

Italian

450 The front view of two Italian palaces shows the regu windows and flat roofs of the Renaissance type architecture. These Italian palaces are furnished wi

454 The flat roofs and regularly spaced windows are typic city houses.

455 The crowded tenements of Sicily are less sanitary York's Italian quarter, but the family laundry decorative.

456 In Florence, the old palaces were of brick and st were spacious with massive furniture.

459 All through Italy are houses of white stucco with roofs. They are picturesque with beautiful g

also used for partitions. The windows are covered with white rice paper instead of glass. Matting and grass woven mats are used on the floors. The Japanese never use chairs — they both sleep and eat on the floor.

The beauty of the Japanese house lies in its simplicity. There are few pieces of furniture, no bric-a-brac and very carefully selected decorations. Only one vase with beautifully arranged flowers and one picture are shown at one time. This picture or vase of flowers is placed in a recess in the room called a tokonoma. A Japanese may own many vases and pictures but only one is used at a time.

The bedding, pillows and their clothes are kept in cupboards or chests of drawers.

The same study of beautiful arrangements of form and color is shown in the Japanese gardens. In all their arts, they avoid bisymmetrical arrangements and their gardens are composed with little streams and waterfalls, rocks, shrubs and dwarfed trees and many kinds of beautiful flowering plants.

526 There is a uniformity among all the Japanese houses, which is not found in a western city.

533 This shows the paper window panes of a Japanese house.

534 Even the fence is beautiful in design. The furniture of the tea house is of course European, for what Japanese lady ever sat in a chair to drink tea!

535 The entire side of this house can be opened to the garden by removing the paper window screens and awnings.

540 The bamboo reeds do not make an effective curtain at this Japanese window.

Mexican

290 The houses of the poorer classes in Mexico were small huts made of adobe with only one doorway and one or two small windows.

New Zealand

591 Very similar to a modern European city.

Norway

409 This picture shows the primitive wood construction of the Scandinavian farmhouse.

411 This shows the crude timber construction of Scandinavian country homes.

Panama

249 What American civilization has done for Panama is seen in these well built comfortable houses.

255 As in all warm climates, wide porches and piazzas make the houses comfortable.

Philippines

546 We cannot imagine very elaborate housekeeping on these boats.

547 Manila. The flat roofs, arched windows and shaded piazzas are

like other Spanish stucco buildings, which are planned for warm climates. The United States has introduced sanitary plumbing.

549 The houses are built on poles with a ladder or notched trees to climb to the entrance. They are high from the dampness and safe from attack. The sides are sometimes covered with matting as are also the floors. The housekeeping is very simple — cooking is done outside on a brush fire.

550 Primitive house construction — lower part like a stockade of woven timbers, the roof roughly thatched with native grasses.

553 Primitive building — note space between roof and walls for coolness and ventilation.

Poland

485 Houses in this picture are similar to the houses of all modern European cities. They are Renaissance in type, with large spacious rooms inside.

Porto Rico

257 The flat roofed houses in Porto Rico with regular arrangement of windows are Renaissance in their origin, having been built by the early Spanish inhabitants.

299 These small adobe houses with their tile roofs so like a Spanish city are primitive in their living arrangements. One or two rooms, with few windows and doors house large families.

Scotch

367 The castles of the feudal period in Great Britain were also fortresses. They are spacious with great halls and sleeping apartments.

368 These sturdy cottages with the smoke arising from the open fireplaces have the attractive hedges and tiny gardens which are a part of all British country.

372 The walls are of rough plaster. The fireplace is built with a raised shelf on either side on which to stand kettles and pots to keep warm. It is called hob grate. Bobby Burns may have heard his mother say "Stand the kettle on the hob." The cooking was done in pots suspended over the fire and baking was done either at the side or in front of the fireplace. The old chair has a split back and is early 18th century type. The sideboard or dresser on which stand the old blue and white plates and bowls is the earliest type of sideboard. It was used as early as Queen Elizabeth's time. It is called a Tudor dresser and was used all over the British Islands. The table is the simple cottage type of furniture. The furniture is probably of oak.

373 The straw-thatched stone cottages of Scottish peasants usually contained one large room with a fireplace where all cooking was done and a small bedroom. The furniture is of sturdy oak, with simple straight line designs, unvarnished and unpainted. There was seldom more furniture than a table, a dresser for china, a few chairs and a bed.

South American and Spanish Houses

Spanish people have a love of beauty and color which expresses itself in their houses. Spanish houses are of stone or plaster and are built around a central patio or courtyard open to the sky. This courtyard is the center of the family life during the hot summer evenings. In wealthy homes, there is a pool and fountain, whose sprays give a welcome coolness. The family receive and entertain their guests in the courtyard during the warm weather. On the second story, both overlooking the street, and within the court, are balconies where the members of the family may sit during the evening.

Indoors, the plaster walls are painted blue, yellow, or other soft colors. The large rooms are simply furnished with massive walnut furniture usually heavily carved or inlaid.

The living arrangements are rather primitive. The cooking is done in a large kitchen over charcoal fires, in glazed pots or bowls and copper or brass utensils.

In many South American countries, the arrangements of the houses is very similar to those of Spain.

304 Here the flat tiled roofs are like those of Italy and Spain.

306 The beautiful ironwork in the balcony shows the influence of Spanish domestic architecture.

307 These white adobe plaster houses are more picturesque than comfortable.

310 The fence of closely placed poles, cut from trees, forms a barrier against small animals. It is used on country estates as a lattice against which to grow vines and hedges. The many windows in the house are necessary in this hot climate.

312 Balconies and covered porticoes are a feature of the houses in Spanish South America.

320 Modern brick construction with corrugated iron roof.

336 Charming Spanish balconies.

337 Spanish influence shows in the balconies and grills at the windows of South American houses.

338 White plaster houses with red tile roofs show Spanish influence.

339 In this warm climate the large number of open windows give light and air and the overhanging eaves give protection from the sun and rain. These windows would not be practical in a northern colder climate. The houses are covered with stucco. The grill work shows the Moorish influence on Spanish architecture.

434, 436 The houses in Spain are strongly built of brick and stone often covered with stucco, with colored tile roofs. As in other European cities, they are built directly on the street, with overhanging balconies on the upper floors, where the family sits in the cool evenings. Indoors the houses are dark and cool in summer and heated only by a charcoal brazier in the short winter. The rooms are large and in the better class of homes the furniture is massive and elaborately carved and decorated in gold and color. The hangings and upholstery materials are of rich silks and velvets. The sanitary arrangements of a Spanish

house are usually primitive and there is more beauty than comfort.

341 The iron grill work on the windows is similar to that used in Spanish houses and shows Moorish influence. Like in old European cities, the houses are built directly on the narrow streets.

Swedish

416 One house shows a gambrel roof. Swedish city houses show a combination of European architectural influences.

417 The great armchair at the head of the table and the sofas and side chairs against the walls are good examples of the French Louis XV period of the 18th century, with their curved legs, broad comfortable seats and backs upholstered in damask silk or velvets. These chairs and sofas of carved and gilded wood were probably imported from France. The side chairs along the table show the extravagant puffing in upholstery of the Victorian period. The walls and ceilings and doors are carved and paneled. The paneling of the walls and over the door encloses great tapestries woven in the 18th century. The great candelabra of cut crystal is also French, similar to those used in the French palaces in the 18th century.

418 In Sweden, the great forests furnish the rough timber of which the farmhouses are built. Inside, there is a great living room extending to the roof, with a fireplace for cooking, and on either side are sleeping apartments. The walls are of rough plaster hung with woven tapestries of geometric design. The furniture is crude, of simple straight lines, often decorated with carving.

Swiss Modern

427 Everywhere the modern concrete construction is replacing the older types of dwellings.

441 No house could afford more cheer to the cold mountain traveler than the warm comfort in these modern mountain hotels.

442 Steep Gothic roofs with dormer casement windows.

443 Plaster walls and simple peasant furniture.

444 Through the valleys of the Alps, small timber cottages are built in which herdsmen may spend the night when off on far pastures in charge of cattle. The heavy stones on the wide roof help to secure it against the wind.

445 The Swiss mountaineer's châlet has wide eaves and slanting roof to protect from winter storms and summer sun. The balconies which hang shaded by the eaves are decorated with carving. Frequently the first floor is used for cellars and stable.

447 The overhanging roofs protect from the winter snows and the hot summer sun. The first story is often of stone, the upper structure of wood.

United States

American Indian Houses

The houses of American Indians varied according to tribe and districts. The Pueblo houses of the Southwest are solidly constructed, of stone and adobe. They had several stories built on top of each other like steps. Most of the tribes built long narrow rectangular houses of timber framework covered with bark, skins and blankets with a door at each end of the house. On each side of the central passage, the space inside was divided into stalls by partitions of skins. Each stall was occupied by a family. In the central passage were series of open hearths where the cooking was done. Many of the tribes had different houses for summer and winter.

After the white men brought horses to the Indians, they began to follow the buffalo and the game and to move about much more than before. They invented the tent now used among many Indian tribes. The framework of poles tied together at the top and spread to make a circle at the bottom is covered with buffalo and other animal skins sewed and laced together and pegged down tight at sides. The smoke hole at the top has a flap which adjusts the drafts for the fires. These tents are pitched in a circle and the horses are tethered inside the circle at night.

263 This very crude tent is made of animal skins not even sewed or fastened together.

265 Indian tents were usually made of skins. This is made of heavy cotton tent material.

Log Cabin (United States)

113 The one story log cabin of the pioneers in the Middle West show their perseverance and rugged character. The logs were laid one on another alternately and the chinks filled in with earth or plaster. There was a brick chimney at one end. Window glass was too scarce to allow of many windows.

Colonial Houses and Furniture

The New England States, New York, and Pennsylvania and the South had colonial houses and furniture of which they may well be proud.

The earliest New England houses were built of wood, with wide clapboards and steep gable roofs. The windows were regularly spaced on either side and above a central doorway. The doorways were especially fine in proportion and detail of classic decoration. They were frequently made with classic columns, and with panels of glass over and at either side of the door. The windows had small panes, for glass was expensive in the early days.

In the South, the houses were larger and more pretentious than in New England. The main central part of the house had a wide piazza with white classic columns. Wings with several rooms were built on either side. The slaves lived in small houses away from the main house.

The kitchen was a large sunny room. In the earliest houses, the cooking was done over the fireplace in pots suspended from cranes and hooks, around which a spacious brick oven was built for baking. Later the stoves were used instead of fireplaces.

Candles and wicks in whale oil were used for lighting until late in the 19th century when kerosene lamps were invented. Cotton prints and chintz imported from England made attractive curtains for windows and four-poster beds.

The women wove rag rugs and sewed braided rags into round rugs. They also made attractive rugs by pulling colored strips of cotton and wool cloths through burlap into patterns of stripes and flowers. These are called hooked rugs.

All over the country the beauty and value of colonial furniture has been realized and museums and private collectors are gathering the now rare and fine pieces of colonial furniture. In all the Eastern States patriotic societies are establishing museums of historic old houses with the furniture of the colonial period.

6 The tenement district has invaded the old residential quarters of Boston, and houses which fifty years ago were fine homes are now rented by floors and rooms to the crowded foreign population.

10 All through old Massachusetts towns are these wide shaded streets and fine colonial houses. The small panes of glass were quite expensive and larger panes were not even made. Inside the dignified front door, the rooms were arranged on either side of a central hall. A stairway with delicate spindles and mahogany handrails curved up to the second story where the bedrooms were arranged. Old maple and mahogany furniture, chairs, sofas, highboy and lowboy bureaus, and tables were placed in an orderly fashion inside these houses. On the floors were woven rag carpets or sewed or hooked rugs. Plain white cloth, cotton prints or chintz were used for curtains.

33 This beautiful old Brooklyn house was built by a retired sea captain in the latter part of the 18th century. The rooms have the fine white mantels and paneled woodwork at doors and windows. The furniture all of old colonials represents many periods. In the living room is a rare Chippendale mahogany armchair. Over the mantel and between the windows are two colonial gold mirrors. The long narrow one has a landscape painted on glass in the panel above the mirror. In the dining room, the empire mahogany dining table is surrounded by chairs of Sheraton design. Against the wall near the door is a fiddle-back walnut chair of the Dutch colonial period. On the Sheraton side table stands a Japanese tea tray decorated with a stenciled gold design and a silver teapot and salt shakers made in 1790. The tall pewter teapot and the old cut crystal goblets and the blue and white china date back to 1800. The rooms are furnished in dull blue and gold. The curtains hang in straight folds to the end of the window trim.

37 This stone Dutch colonial house has the small window panes and long sloping roofs of the early cottages.

90, 91 A beautiful example of classic colonial architecture. The interior has been redecorated in the original style.

92 The beautiful mantel of Adam classical design and the cornice and finely paneled door with glass knob are fine examples of colonial interior design. The furniture, while entirely modern, has a simplicity and elegance and fitness not always found in our public buildings.

96 The Southern colonial mansions were less austere than those of New England. The two story portico supported by classical columns was a feature of southern houses of the 18th century. Frequently there was a small balcony from the second story windows. Many southern houses had wings or porches on each side of the main central building. Mt. Vernon is one of the most beautiful houses in America, one of which all Americans may be proud. It compares favorably with the fine houses in the Old World.

Modern Houses (United States)

211 Small frame houses spring up almost over night in the new Western States. They have modern sanitation and are more comfortably arranged than those of 20 years ago.

212, 213 Everywhere in the large American cities, apartment houses are simplifying the cost and labor in housekeeping.

214 In mining towns all over the United States, the houses are crudely built and lack the beauty of little villages in Europe.

220 A city of homes.

147, 181, 236 It can no longer be said that the farmer houses his cattle and horses better than his family, for the modern American farmhouse is well built and well arranged, with telephone service and, in some districts, electric lights.

236 Modern farmhouse with gambrel Dutch colonial roof. In southern California, the hot water supply is often furnished from a tank on the roof where the water supply is left open and heated by the sun.

II. COSTUME DESIGN

The clothes of the people reveal their civilization. They express the manners, the habits of living, the workmanship, the art of the people. The materials used represent the local products and the wealth. They often bear a relation to the religion. In many countries they have local costumes which repeat the life of past generations. The women in medieval times wore high caps and other headdresses from the back of which were long flowing veils. The modern peasant headdress shows this medieval influence.

With the development of courts and manners the costumes of both men and women become more complex and elaborate. In colonial days in America, the fashions followed those of France and England. George and Martha Washington dressed as the gentlemen and ladies of their time in England and France. In the 19th century, the knee breeches developed into the long trousers worn by the men of today. Women's costumes, however, have gone through many transitions of fashion since then. Taste in clothes has improved and much attention is being given to the designing of practical and beautiful dress.

In these days of rapid and easy communication, varieties of clothing are disappearing. In almost every country will be found people dressed in the formal clothing which we are used to seeing and native costumes are gradually being displaced. This proves how very adaptable such clothing is. Made of light material, loosely fitted, it is suited to the warmest climates; made of heavier material, it can be worn even in the coldest regions.

A. MODERN COSTUMES

Modern Dress

8, 22, 29, 235, 273, 275 These people of the United States and Canada are dressed in the same manner.

60 The sweaters and trunks of the short skirted bathing suits of women are worn at every American bathing beach.

276 The shirt waist is an American article of dress and has never become so popular in Europe as in America.

249 The United States has shown the natives how to dress.

257 The white costumes of the native may not be as clean as they look but they are cool and comfortable.

258 These laborers are dressed like the negro workers in the Southern States.

280 The Mexican always wears a large brimmed felt or woven straw hat.

281 The poor natives of Mexico dress in primitive garments for protection from the heat and sun.

290 More purely Spanish costumes would only be found in a Spanish village. The wide sombrero hats of the Mexican are woven of grasses with bright colored straws for decoration. The hand-woven Indian blankets of bright colors are more for decoration than warmth.

292 These cotton print dresses have been adapted to the needs of the hot climate.

284, 285 The Mexicans make baskets and hats of the native straws. Wide brimmed hats are worn in all the semitropical countries.

295 Cuban native workmen wear simple, rough cotton clothes similar to those of the American rural negro of the South.

297 One of the men wears a Mexican sombrero.

319 They pay as much attention to their dress as does their brother in sunny Italy.

355, 365, 375, 404, 423, 424, 438, 443, 463, 464, 486 In Europe in both warm and cold countries this same style of dress prevails.

541 In China and Japan, Western dress has become common.

557, 581, 582 Africa feels the influence of Europeans in the matter of dress.

585, 590 Australians dress as the English do.

324 Like in all Latin countries, the peasant women go about the streets without hats. Usually a black veil or scarf is worn on dress occasions, for it is forbidden to go into a church with uncovered heads. The long cape and shawl are frequently worn both by men and women.

328 Very primitive costumes of skins crudely fastened together and blankets are worn over heavy wool skirts.

331 The pattern and cloth in the costumes show the high development of textile design and weaving of the Inca Indians, the prehistoric tribes of Peru. The blankets worn as shawls are in Spanish fashions. The hats are also Spanish in style.

338, 339 The natives' costumes show the influence of the old European civilization which has been here for centuries.

340 The European clothes of men. The boys in comfortable white trousers and barefeet.

300 The negroes usually adopt the dress of the people of the country in which they live. The material of the woman's dress is a cotton print of gay colors, probably made in England. The headdress is usually of gay cotton handkerchiefs bound about the head in protection from brilliant sunlight.

Modern Working Clothes

11 The making of shoes has reached the highest perfection in the United States. "American shoes" are the best.

15, 40 The modern factory girl is tidy in her dress.

42, 75, 130, 227 High rubber boots protect from the wet.

44 American overalls and hat protect clothing while at work.

46, 57 Health laws have made dairy men observe sanitary rules in dress.

105, 117 Negroes in the South dress like their poorer white brothers.

142, 143 Pure food laws require sanitary dress, therefore absolute cleanliness marks the working costumes of men in the packing houses.

227 Chinese workmen of the Pacific Coast have adopted American clothes.

243 The warm clothing of the trappers and miners of Alaska is a necessary protection during the long winters.
245 The net masks protect from mosquitoes which come after the melting of the snows.
431 Modern European working women look very much as Americans do.
481 The shawls which these women wear on the heads are also used as neckerchiefs.

Children's Dress

Children's clothes are much like those of their elders. Among European peasants, children's dresses are elaborately made and decorated. The poor children of Oriental countries wear very little clothing or none at all.

61, 187 Clothes of a typical American school boy.
72 Every child dons its prettiest white frock for the Maypole dance.
236 Children dressed comfortably for play.
239 These little children hardly realize the millinery use to which the ostrich feathers will be put by their elders.
292 Little children in warm climates need very light clothing.
290 The little Mexican children wear typical Spanish costumes very much like those of their elders.
306 These children are dressed very much as American children. One little girl wears a dress of elaborate lace made by drawing threads and darning in patterns.
336 The pretty white lace trimmed dress probably came from Paris.
341 The clothing of these children is very like that of American or European children.
413 A little Laplander is comfortable in clothes of reindeer skin.
437 This Spanish boy is not dressed very differently from the common American boy.
465 The bright colored needlework of Galician women is shown in the school satchel carried by the girl.
471 Picturesque peasant costumes. The short jacket of the boy is decorated with many buttons, and the skirts of both mother and child are decorated with characteristic embroidery.
487 These Russian peasant girls have the bright colored needlework on their skirts and collars.
498 The street garments of the Orient. The headdress is decorated with coins.
520 The long coats and skirts of the Chinese children are very picturesque. Their slippers made of bright colored materials turn up at the toes for easy walking.
522 This belt and coat of the Chinese boy is similar to the Russian peasant costume.
530 A serviceable costume for walking and a rice straw hat which protects the complexion. Japanese are adepts in basket making.
532 The Japanese wear sandals made of woven straw and fastened across the ankles with band of bright colored material. This

picture shows the obi, sash, worn about the waist of the kimono.

534 Pretty cotton materials are worn in Japanese kimonos. The mothers carry the babies in a carrier strapped to their backs, not unlike that of American Indians.

562 The turbans and simple flowing garments are comfortable attire for the hot climates.

563 The Egyptian costume has not changed much in many centuries.

Modern Military Uniforms

146 The United States has long used inconspicuous uniforms of dark blue. This has given place to a still less conspicuous uniform of khaki.

266, 366 The Highland costumes are very picturesque with plaited skirts made of the plaid of the clan. Each clan has a different plaid. These are the service coats of the costume made of fine broadcloth. The small caps date from Rob Roy. The great brushes worn suspended from the belts are reminders of the trophies of the hunt of older days. They are now used as purses. The fashion of light topped shoes and gaiters here worn is centuries old.

385 No nation in the world has given so much attention to the details of military uniforms as have the Germans. This uniform used on dress parade is discarded in war time for one of an invisible gray color.

426 The French military uniform has always been gray of trim cut, with brilliant colors in the decorations. The Zouaves wore short blue jackets and scarlet trousers. These have been discarded for the service uniform of invisible or earth color.

476 The Royal Guards of the King's palace wear the fustanella or wide cotton kilt which was originally part of the Albanian peasant dress.

Peasant Costume

In rural districts and small cities and towns the peasant costumes have changed very little in centuries. Each province or district usually has some distinctive feature. The costumes are decorated with the characteristic needlework and handicraft of the community.

262 The kerchief and cap headdress of the French Canadian girls suggests the costume of the Brittany fisher folk of France. The dress is of strong homespun wool for which there is a good market in American cities.

373 These old peasants wore simple dresses of homespun wool and kerchief caps of linen. They made the materials, cleaning, carding, spinning and dyeing the wool and weaving the homespun; and retting, bleaching, spinning, and weaving the flax into linen.

388 The costumes of these peasant women have not changed in generations. It has the tight bodice and kerchief of the 18th century. The hats are similar to those worn by all mountain people of Central Europe. The wool skirts and heavy stockings are products of home industries.

wooden sabots.

401, 402 Dutch women wear wide skirts, tight bodices w chiefs and beautiful white caps. The men wear wid and tight short jackets.

409 The neat dress of Norwegian women showing in the silver and gold the fine workmanship of the Sc countries.

411 The Scandinavian working girl's costume like other dress. Peasant headdress on women. Goats' hair into materials for dress.

410 Hats are unknown among the poorer peasant wom rope.

413 Skirts and warm belted coats of reindeer skin are neces cold climate.

418 Swedish women's costumes. The apron is woven of ored material. Many silver ornaments for fastening belts are worn as well as merely ornamental rings necklaces. A Swedish peasant bride in the older sembled a jeweler's shop window, so covered wa silver ornaments.

449 The mountaineers of Switzerland wear low brimm protect them from the hot rays of the sun which a from the snow. They carry long poles to guide tl in climbing.

466 Throughout Austria, many picturesque costumes wit broideries and elaborate caps are still worn by the

471 Picturesque peasant costumes. The short jacket of decorated with many buttons and the skirts of moth are decorated with characteristic embroidery.

465 The bright colored needlework of Galician women the school satchel carried by the girl.

468 The costume of Bulgarian peasant, with bright colo ery.

460 The quilted coats and embroidered dress of the

488 The Russian peasant wears a blouse belted at the waist, high boots and in colder parts of Russia, a fur cap.
496 The women peasants of Russia with their wide skirts and shawls show the drudgery of their lives. The caps and long belted coats of the men are more picturesque.
544 Siberia. The high boots and long coats of Russia.

II. ORIENTAL COSTUMES

Arab Costumes

Throughout Mohammedan countries in Northern Africa and Asia Minor, the costumes are somewhat similar. The sheiks and men of importance wear loose long robes, flowing white headdress of cotton and wool materials. They wear sandals or go barefoot. The poorer classes wear very little clothing — they are bare to the waist, wear one straight garment and huge turbans to protect their heads from the sun.

494 The long belted garments and turbaned flowing headdress have been worn by Arab chiefs for centuries throughout Asia Minor and Northern Africa.
555 The turbans and flowing headdress of the Arabs differ very little from those worn in the Orient. The modern European dress shows the difference in civilization between the Mohammedan and the Christian.
566 The long flowing garments and turban of the Arab are more elaborate than the simple straight garment of the Egyptian water boy or carrier.
557 European influence shows in Tunis costumes.
558 Turkish fez.

Egyptian Costumes

561 Egyptian peasant costumes have changed little since ancient days.
562 The fez and loose white garments are typical of Mohammedan countries.
564 The turban headdress is a protection from the sun.
565 The turban and flowing garments of the Egyptian are frequently of white to protect from the strong sunlight. The trappings of the camels' saddles are elaborate and beautiful, of rugs and knotted fringes.
566 The long flowing garments and turban of the Arab are more elaborate than the simple straight garment of the Egyptian water boy or carrier.
567 Egyptian boys and guides go barefoot in the hot sands, but seldom without a turban.

Ceylon Costumes

511 The turban is worn in tropical Asia.

East Indian Costumes

500 Loose flowing garments, long coats and turbans are worn by men in India.

501 There is no fashionable bathing-suit for East Indian natives.
503 The turban headdress of men and the long straight garments are characteristic of the costume of Mohammedan countries.
504 This East Indian city shows a motley crowd, wearing the long cotton garments and turbans of the East.
505 The long skirted garments of the East Indian natives are of cotton material sometimes decorated with colored embroidery.
506 The East Indian man is never without his turban. The beautiful many colored shawls which they wove were fashionable in Queen Victoria's time. In Paisley, Scotland, machine copies of Indian shawls were made.

Chinese Costumes

The dress of the Chinese differs according to climate and the class of the people.

The working people wear two loose garments of coarse deep blue cotton materials. In cold weather, the thin coat is replaced by a quilted and wadded one. The men wear their hair in a long straight braid called a cue. When working, this is sometimes bound about the head. In the fields, wide conical brimmed rice straw hats are worn for protection from the sun. On gala occasions silk garments are worn. Slippers of straw or cotton materials turned up at the toe are worn by both men and women. The poorest classes wear very little clothing. The men usually are naked to the waist and barefoot.

In the coast cities, the Chinese are adopting European dress. The cue is slowly going out of fashion, in consequence of which great shipments of Chinese hair come into American markets for the manufacture of false hair.

516 Many of these coolies have dispensed with the cue.
517 The Chinese coolie or workman wears simple garments of cotton materials.
518 The quilted coats and warm clothes are necessary during cold weather.
519 A variety of Chinese costumes.
521 The Chinese were very proud of their long braided cues of hair. They are now adopting the hair cut of the American and European.
522 The Chinese primitive costume.
531 One of these kimonos shows the tying of the obi at the waist.
543 White costumes are usually worn in semi-tropical climates. Korean (Chosen) costumes are similar to the Chinese.

Japanese Costumes

Japanese women wear three or four straight kimono-like garments one over the other. At the open folds of the loose sleeves the different colors of the garments may be seen. The obi, or wide sash, is the most important part of the Japanese woman's dress. Some are richly embroidered on silk or the very costly ones are of cloth of gold.

The Japanese wife and mother never wears bright colors nor adorns

her hair. The geisha girls wear bright flowers in their hair and lovely bright colored kimonos. A woman's age can be told by the colors she wears. The same colors are worn at certain ages by all women.

The Japanese men wear loose trousers and straight rather short kimonos, belted at the waist. The field laborers wear loose blouse-like garments belted at the waist and wide conical shaped straw hats.

Both men and women wear short light stockings and sandals or slippers. They carry gay parasols when out walking.

American and European clothes are being adopted in the large cities.

527 The girdle is all this Japanese planter has kept of his picturesque native costume.

528 Adaptation of Japanese costumes for working in the water of the rice fields.

529 The great straw hats which protect the workers from the sun in the rice fields.

530 A serviceable costume for walking, and a rice straw hat which protects the complexion. Japanese are adepts in basket making.

532 The Japanese wear sandals made of woven straw and fastened across the ankle with bands of bright colored material. This picture shows the obi sash worn about the waist of the kimonos.

533 The elaborate headdress of Japanese women is not disturbed when they sleep.

534 Pretty cotton materials are worn in the Japanese kimonos. The mothers carry the babies in a carrier strapped to their backs not unlike that of American Indians.

535 Beautifully embroidered kimonos are worn by wealthy Japanese girls. On one of these kimonos is shown the obi. Miniature gardens artfully planned, with waterfalls, shrubs, trees and flowering plants, are one of the great artistic achievements of the Japanese.

536 The costumes of this Japanese man and woman differ very little. The silk from these silkworms will be woven into beautiful materials and probably sold in America. Since the great European war, much of our silk has come from Japan.

537 Light trousers and long shirts with wide belts are made of cotton materials. The conical shaped hat is made of rice straw and is worn in the fields for protection from the sun.

536 The kimono of the Japanese factory girl's costume differs very little in cut from the costumes of her wealthier sisters.

540 Beautifully designed Japanese crêpe in kimono. See Silk Industry.

541 Japanese factories have become Americanized even to costumes. Note shirt waists of girls and business tailored suits of men.

Hawaiian Costumes

260 American influence shows in the clothes of the younger generation.

261 The dancing girls of Honolulu usually wear skirts of coconut fiber, but these have adopted the European materials. Their decorations of flower wreaths swing rhythmically as they dance.

The dark skinned natives of central Africa are st
their costumes consist of very little covering. In man
tives painted their bodies for ceremonial occasions.

The men wear a loin cloth. In some tribes, the wo
of leaves or vegetable fibres. Bright colored beads an
are worn in some tribes.

Missionaries tell amusing stories of the African inter
dress. At one celebration of a local chief, the men
carded hats and brims of hats of European travelers, w
costumes.

572 The semicivilized and savage tribes wear very f
loin cloth wrapped about their bodies suffices.

570, 573 These native Africans have lived near the g
commercial posts on the west coast, and are
than their less civilized brothers of the interior.

578 The natives' dress is most primitive, consisting o
cloth. Their uncovered heads bear the intense he
ical sun.

581 The dress of the white man and the negro shows th
civilization in South Africa.

Fiji Island Costumes

592 The most primitive savages wear a loin cloth of
material. Frequently they have elaborate headdr

Philippine Costumes

543, 546 White clothes are usually worn in semitropic
548 The wide hats of the men are of Spanish origin.
549 Primitive Philippino costumes.
550 These costumes show European influence.
551, 552 This Philippino native wears clothes for comf
553 Manila native costumes [illegible]

American Indian Costumes

The dress of the different tribes of American Indians varied with the degree of civilization and with their ceremonial customs. The costumes were usually made of the cleaned and dressed skins of animals.

The costumes of Indian men consisted of several garments. In all tribes, the men wore breechclouts of skin or cloth fastened between the legs and brought up and held by a belt which fastened in front with long decorated ends. Over this were worn buckskin leggings fringed on the outer sides and a jacket or shirt of buckskin often reaching to the knees. This was decorated with beads, feathers or painting. Over the shoulders was worn a long woven blanket. The war headdress consisted of a crown or band of upright feathers and fastened to this a long strip of cloth to which eagle feathers were attached. This headdress was supposed to protect the wearer from the arrows of the enemy.

Both men and women wore moccasins of soft skins which were elaborately decorated with beads.

The Indian women wore buckskin trousers, short skirts reaching to the knees and short bright colored jackets. They wore their hair parted in the center and either braided in two long braids or bound loosely with decorated headbands.

Both men and women wore silver ornaments, necklaces, beads and bracelets. The men's necklaces were made of elk teeth and badger claws, representing trophies of the hunt.

In many Indian tribes, American dress has been adopted.

98 The fringes and bead-work decoration are more elaborate than in the average everyday costume of the Indian.

158 Little papoose in his warm handwoven blanket admires the lovely bead-work and leather trimmings of his mother's dress. How pretty is this Indian mother's beaded headband and fringed skirt and sleeves, and how patiently she dyed and wove the bright colored blanket for her papoose.

168 The beaded and feather headdress of the Indian maiden and the elaborate skin costumes of the men are ceremonial in their elaborate decoration.

169 With their silver necklaces and bracelets and elaborate dress, these Indians are on peaceful mission.

182 The elaborate feather headdress of Indian men. The costumes as well as the horses' bridles were decorated with bright colored beadwork.

204 This Indian has accepted the white man's dress. His wife wears her hair braided in two plaits and near the woven Indian blanket stands the board which she wears strapped to her back for carrying her papoose.

244 These Indians have adopted American clothes.

263 These Indians in their American clothes are working on their beautiful grass baskets for sale to the American tourists.

265 Good examples of the elaborate decorative bead-work on Indian costumes.

NOTE: The Keystone View Company's General Catalog presents a list of many thousands of stereographs and lantern slides. Especial emphasis is placed on the complete series dealing with our great industries. There is also a full list of Travel Tours and miscellaneous subjects. This General Catalog is sent free upon request.

THE PUBLISHERS.

43. PHOTOGRAPHY

By C. E. K. MEES, D.Sc.

DIRECTOR RESEARCH LABORATORY, EASTMAN KODAK COMPANY, ROCHESTER, N. Y.

Since the "600 Set" of Keystone stereographs and lantern slides are made by means of the camera, they naturally present an excellent series of examples for a study of the art of photography and especially for that part of the art which deals with the composition and arrangement of photographs. They can be used for the study of composition, scale of gradation, and perspective with great advantage, and suggestions are made here for the selection of scenes illustrating these various points.

The study of composition by means of these photographs is particularly valuable, as few people realize the way in which pictures are built up or constructed.

Then, again, we see photographs taken under various conditions with the objects at different distances from the camera, ranging from very close to very far-away photographs, in sunlight and shadow, and even under such unusual conditions as at the bottom of mines a mile under the earth, or photographing millions of miles through space.

There are excellent interior photographs and architectural photographs in the "600 Set" of stereographs and slides, but it is particularly when we deal with the applications of photography there shown that we realize the wide scope of the art of the camera. We have photography applied to industry, to farming, to surveying, to the recording of scenes in the mountains and in the tropics, to the recording of the habits and costumes of mankind in many parts of the earth, and of the behavior and life of birds and animals, while, finally, the astronomer uses the photographic plate as his chief tool and is able to contribute some wonderful records of the heavenly bodies.

1. THE COMPOSITION OF A PHOTOGRAPH

Composition is the art of placing the different objects in a picture so as to be pleasing to the eye and best tell the story. An essential to good composition is a point of central interest around which the picture is built up. It is usual to choose a point of interest and then to arrange the standpoint so that the lines of the picture are concentrated on it and lead the eye up to it.

6 Old North Church, Boston. The point of interest in this picture is the church in the distance, and the convergence of the lines of the street lead the eye to the church so that the whole picture is built around it. Compare with 406, The Krystal-Gade and the Round Tower, Denmark; 502, The Taj Mahal, India; 79 Shipping coal, Ashley, Pa.

70 Oil Field, Pennsylvania. Here again the lines of the trees and the very attitude of the people in the foreground all converge on the well, which is the center of interest in the picture. See also 448 The Matterhorn, Switzerland; 300 Volcanic eruption, Martinique, F. W. I.; 88 Congressional chamber, Washington, D. C.; 98 Pocahontas pleading for the life of John Smith, Jamestown Exposition.

418 Dalecarlian girls, Stockholm, Sweden. The figures of the two girls here make the center of interest. It should be noted that the center of interest should not be exactly at the center of the picture but should be near the center. See also 292 Tortilla making, Salvador, C. A.; 295 Unloading coffee, Havana, Cuba; 373 A highland home, Scotland.

104 Flooding rice fields, South Carolina. If there is not a natural center of interest in the picture, it is sometimes possible to utilize casual objects to make a center of interest. Thus in this picture the black piles in the water combined with the water gate make a center of interest on which the composition of the photograph is built. See also 294 Harvesting bananas, Costa Rica, C. A.; 229 Fallen monarch, Yosemite Valley, Cal.

525 Sacred Mountain of Fuji-Yama, Japan. In this picture the boat with its white sail makes an excellent center point. Note center point in these: 575 Bridge over Zambezi River, Africa; 405 Frederiksholms Canal, Copenhagen, Denmark; 535 Japanese garden.

507 Ferryboats, India. Here the group of people in the foreground make an excellent center to the picture. Compare with 528 Rice planters, Japan; 549 Harrowing rice, Manila.

443 Wood carver, Switzerland. In a portrait it is often an advantage to have the subject intent on something so that the eye is led by the gaze of the subject himself and by his attitude toward the center of interest. Compare with 538 Feeding mulberry leaves, Japan; 540 Reeling silk, Japan; 550 Hulling rice, Philippine Islands; 585 Review of troops, Sydney, N. S. W.; 551

Husking coconuts, Philippine Islands; 132 Building up automobile tire, Akron, Ohio.

171 Hydroelectric generators, Keokuk, Ia. In every landscape composition we must have a general controlling shape correctly placed in the picture, and if a secondary controlling shape is present it must be in some way connected with the first. Perhaps the simplest composition for a photograph is that of converging lines, the center of interest being in the middle distance or far distance and all the lines of the photograph converging to this, as was seen in stereograph or slide 6, Old North Church. There are many good examples of this in the set of photographs. See 322 Inca Lake; 399 Water Street, Zaandam, Holland; 270 Sugar beets, Montreal, Can.; 163 Burt mine, Minnesota; 149 Harvesting celery, Kalamazoo; 390 Picking grapes, Germany.

133 Rubber boots and shoes, Akron, Ohio; 286 Carding room of cotton mills, Mexico. These examples of interior scenes show this convergence. It should be noticed that care has been taken in these pictures that the center of interest is not in the middle of the picture, the standpoint being chosen so that the convergence of the two sides of the picture is not quite the same, thus giving a much more pleasing view than if a center view were chosen. Examples of the same composition occur in all kinds of scenes. See topic of Parallel Perspective in classification on Drawing.

30 Broadway, New York; 139, State Street, Chicago; 167 Nicollet Ave., Minneapolis; 308 Rua 15th of November, Sao Paulo; 331 Street in Cuzco, Peru. Street scenes with their straight lines lend themselves particularly to this kind of composition. See also 463 Traffic in Vienna, Austria-Hungary; 339 Street of La Guaira, Venezuela; 422 Avenue des Champs Elysees, Paris; 513 "Queen's Road," Hongkong; 504 Spacious thoroughfare, Jaipur, India; 273 Main Street, Winnipeg, Can.; 336 Street Scene, Guayaquil, Ecuador.

105 Hoeing rice, South Carolina. In open air scenes a good example of this type of composition is found. 251 Excavations in Gaillard Cut, Panama, and 74 Stripping coal, Pennsylvania, show the use of railroad crossings to produce convergence lines. 128 Unloading iron ore, Conneaut, Ohio. Railroad tracks and cars themselves used for lines converging upon the freight loader, which is the center of interest.

347 Landing stage, Liverpool, England. The edge of the landing stage has been used in the same way.

129 Trainload of coal, Conneaut, Ohio. It shows a modification of this convergent composition, the convergent lines in this case being curved so that we get a long sweeping curve which makes a very beautiful composition.

404 Queen Louise Bridge, Copenhagen, Denmark. The same general scheme of composition.

430 Cannes, France. 304 City and harbor, Bahia, Brazil. Here it is present, though less clearly marked.

489 Bosphorus, Turkey. A less usual form of controlling shape, this being an elliptical shape in the foreground. The theme is duplicated in this slide, both the mound surrounded by trees and the sea in the distance taking the elliptical shape.

316 Four o'clock parade, Palermo, Argentina. This elliptical figure again, with some tendency toward the converging curve.

326 Harbor and city, Valparaiso, Chile. A shape frequently used in the composition of landscapes is the zigzag. The eye is first led to the right by the white road at the bottom and then again to the left.

528 Rice planters, Japan; 529 Rice harvest, Japan. The composition of these pictures is very greatly helped by the use of the zigzag shape. The line of work-people would lead the eye out of the picture were it not for the break in the rice, which leads the eye back again. 210 Roosevelt Dam, is also an example of zigzag shape.

369 Ellen's Isle, Scotland; 461 Public Square, Gratz, Austria; 200 Phœbe's Arch, Colorado. Occasionally in landscapes great use can be made of the vista composition, that is, of a choice of position such that the picture appears to be framed within some natural objects close to the camera. This is particularly effective in stereoscopic views.

536 Silkworm incubator, Japan; 561 Farm scene in Egypt; 564 Inundation of the Nile, Egypt. In photographing groups it is important to have some definite geometrical design in mind in arranging the group. Perhaps the safest design is a rough pyramid, thus, in 536 the bodies and heads of the two figures together with the man's hand leading the eye up to the thermometer make a roughly pyramidal shape.

548 Cattle as pack animals, Island of Luzon. The group of animals and riders in the foreground duplicates in its lines the mountain in the background.

498 Grinding wheat, Palestine. An excellent example of a perfectly posed group. The women, forming a pure pyramid and keeping intent on their work, make a very pleasing picture.

2. LIGHT

a. The Scale of Gradation

Since the purpose of photography is to represent by the different tones of the print the relative brightnesses of the corresponding portions of the original scene, the most important thing in obtaining an accurate photograph is that the scale of gradation of the photograph shall correspond through all its tones to those of the original scene. This can be accomplished only by correct exposure and development of the negative and by printing upon a paper exactly suitable to the scale of the negative. Such a photograph, having a very accurate scale

of gradation, is said to be of technically good quality and is invariably pleasing to the eye.

While all the stereographs and slides represent the scenes well, the following have been selected as showing a particularly excellent scale of gradation:

18 Scene in a woolen mill, Lawrence, Mass. Note the way in which the variation in brightness of the bobbins on the right as they recede into the distance is accurately reproduced. See also 14 and 16 Scenes in a cotton mill; 22 and 24 Scenes in a silk mill.

50 Niagara Falls, N. Y. In this very beautiful scene all the fine gradation of the highlights is retained and produces the charm of the picture.

70 Shooting oil well, Pennsylvania. In this view we have particularly accurate rendering of the middle tones. See also 83 School gardens, Philadelphia; 112 Tobacco field, Kentucky; 117 Picking cotton, Mississippi; 138 Horses at work, Indiana; 176 Zinc and lead mines, Missouri; 180 Farm machinery, Nebraska; 359 Nightingale, England.

72 June Carnival, Pennsylvania. Here again the middle tones are correctly reproduced while the detail in the white dresses of the children is retained.

74 Stripping coal, Pennsylvania. Note the retention of gradation and detail in the shadow in this picture. Any underexposure would have been fatal to this.

192 Angel Terrace, Wyoming. This view is remarkable for the accurate rendering of the gradation of the high lights. See also 196 A beaver dam, Yellowstone Park; 197 Grand Canyon of the Yellowstone National Park.

543 Charcoal carriers, Chosen. This is a good example of portraiture in natural surroundings. The lighting of the face deserves study.

200 Phœbe's Arch, Colorado. In spite of the extreme range of brightness occurring in this view, the distant hills and the dark rocks are retained in perfect gradation. See also 202 Box Canyon, Colorado; 235 Burbank and the spineless cactus, Santa Rosa, Cal.

216 Port Blakely mills, Seattle, Wash. The gradation in this view is excellent throughout. Note that the highest light is not in the sky but in the near foreground.

258 Cutting sugar cane, Porto Rico. Observe the gradation shown in the white shirts of the men. Compare with 290 Mexican musicians.

291 Volcanoes, Gautemala, C. A. The accurate reproduction of the high light detail helps to give the sense of distance in this view. See also 274 Glacier, Canada.

301 A cattle ranch, Jamaica. This is a good photograph of a rather easy subject.

361 Lake District, England. Photographically considered, this is perhaps a most perfect reproduction.

408 Jordal Valley, Norway. Note the retention of gradation at the two extremes of the scale — in the water and snow, and in the dark hillside. See also 412 Paper mills, Skotifos, Norway; 419 Field of sugar beets, Sweden; 444 Lauterbrunnen Valley, Switzerland.

489 Looking up the Bosporus, Scutari, Asia. While there are no extreme contrasts in this view, any failure of gradation would have been fatal to its beauty. See also 506 Weaving woolen shawls, Srinagar, Kashmir.

525 Fuji-Yama, Japan; 530 Tea fields, Shizuoka, Japan; 562 Threshing beans, Egypt. The rendering of gradation is very good.

575 Bridge over Zambezi River, Africa. The gradation in this scene from high light to shadow is particularly good.

b. Flashlight Work

Photography by artificial light is a very fascinating branch of the art and the use of burning magnesium powder, either in what are termed "flash cartridges" or "flash sheets" only requiring to be fastened up and lighted, makes it possible to obtain photographs under conditions which without this method would be quite impossible.

2 Wild moose, Maine. This is a wonderful flash-light photograph of a wild animal at night.

76 Coal mines, Scranton, Pa. Here the flash-light has been used to give us a picture of the miners actually getting coal from the mines.

155 Calumet-Hecla Mines, Michigan. This photograph, taken a mile underground, is an excellent example of flash-light work.

579 Gold Mine, South Africa. Here again, we have a picture in a gold mine showing what can be done by flash-light photography.

3. PERSPECTIVE

A lens photographs a scene exactly as the eye sees it from the same standpoint, and when a stereograph is examined the rigid correctness of photographic perspective is easily realized. The apparent falsity of perspective in some photographs is due to the fact that to get correct perspective the eye should be at the same distance from the photograph as the lens was from the plate or film when the picture was taken. If a lens of very short focus was used, it would be difficult to view the picture from a sufficiently small distance and the perspective would appear incorrect. In the stereoscope, however, the viewing distance corresponds to the lenses used in the camera and correct perspective is realized.

366 Great Forth Bridge, Queensferry, Scotland. Note the strong perspective when this is viewed from a distance; in the stereoscope the perspective is seen to be correct.

392 Bridge over river Rhine, Germany. Owing to the greater distance of the bridge from the camera, the perspective in this view appears much less violent than that of 366. Compare with 470 Bridge over the Danube River, Roumania; 472 Galata Bridge, Constantinople, Turkey.

34 Conveyor with trays of loaf sugar, New York; 171 Hydroelectric generators, Iowa; 270 Sugar beets stored in sheds, Montreal, Can.; 139 State Street, Chicago.

a. Depth of Field

In many photographs some objects are close to the camera and others are very far away, and such objects at different distances from the camera can only be photographed to give an equal degree of sharpness by the use of a small aperture in the lens.

1 Logs, Aroostook Co., Maine. Notice the sharpness of all the different objects at various distances from the camera. Such a view is said to have great depth of field.
See also 5 Chiseling marble, Proctor, Vt.; 10 Lexington Common, Lexington, Mass.

b. Rendering of Distance

The obtaining of clear photographs of distant objects in a landscape is a matter of great difficulty if the atmosphere is at all hazy, as it usually is in northern latitudes. At the same time this haze in the distance may be of value as giving a sense of distance which could not be obtained in a clearer view.

51 Palisades of the Hudson River, New Jersey. Here one gets a strong sense of the distance of the opposite shore of the river, owing to haze.

190 Sheep, Idaho; 237 Orange groves, California. In the sharp, clear air of this view, the distant hills show but little more mist than the rise in front of them. See also 228 The Sierras, California.

288 "Old Popocatepetl," Mexico. Here in the clear air of the tropics we see the mountain at a great distance, clear-cut against the sky.

4. STEREOSCOPIC PHOTOGRAPHY

A stereograph does not consist of two ordinary pictures but is a double picture taken by two lenses placed three inches apart so that they photograph two distinct images of the same subject from slightly different standpoints. The combination of these two images in the stereoscope gives the appearance which would be seen by a person whose two eyes occupied the position of the two lenses of the camera when the stereograph was taken. This principle is well illustrated by comparing the following stereographs with the corresponding views made by mounting side by side on one card two ordinary photographs taken from the same standpoint.

231 Earthquake fissure, Berkeley, Cal.
The same view without stereoscopic effect.

303 Cacao tree, Dominica, B. W. I.
The same view without stereoscopic effect.

197 The Grand Canyon of the Yellowstone, Wyoming.
The same view without stereoscopic effect.

5. SUBJECTS AND SCENES

a. Unusual Subjects

The following photographs are of interest owing to the unusual nature of the subject photographed; the hot metal must have presented photographic problems of no small difficulty.

65 Steel mill, Pittsburgh, Pa. Note the halation from the intensely bright white-hot steel as it pours into the mold.

67 Steel works, Pittsburgh, Pa. The showers of sparks from the rolling mill make a most interesting stereograph.

414 In this wonderful photograph of the midnight sun, an effect is seen which is common in photographs where bright lights, such as the sun, are included in the field of view. This is the reversal of the light source itself, the brightest portion of the sun being seen as a dark ring against the bright halo surrounding it.

b. Interiors

In photographing interiors, the arrangement of the lighting is of the greatest importance if a harmonious picture is to be obtained. It is especially important that the lighting should be as even as possible.

33 Dining room and living room. This is a good photograph of an interior.

92 The Cabinet Room, Washington, D. C. Note the excellent lighting in this photograph.

372 Burns' cottage, Scotland. Here we have an interior in which the gradation throughout is good. In such a scene as this there is often great difficulty in avoiding underexposure in the side farthest from the window.

533 Japanese home. This interior is smoothly and well lighted, a pleasing effect being obtained. See also 14, 16 Cotton mills, Lawrence, Mass.; 17 Woolen mill, Lawrence, Mass.; 20 Paper mill, Holyoke, Mass.; 34 Sugar factory, New York; 53 Silk mills, Paterson, N. J.; 57 Modern dairy, Plainsboro, N. J.; 59 Pottery, Trenton, N. J.; 65 Steel mill, Pittsburgh, Pa.; 132 Rubber plant, Akron, Ohio; 135 Plate glass works, Rossford, Ohio; 141 Packing house, Chicago; 151 Automobile plant, Detroit, Mich.; 153 Packing salt, St. Clair, Mich.; 171 Hydroelectric generators, Iowa; 268, 269 Linen mill, Canada; 353 Regulator of the world's clocks, Greenwich, Eng.; 412 Paper mills, Norway; 417 The council room, Royal Palace, Stockholm, Sweden; 536 Silkworm incubator, Japan; 541 Silk weaving plant, Japan.

c. Architectural Photography

Photography has been of great assistance to the architect and the photography of buildings is a fascinating branch of the art. The "600 Set" of stereographs and slides contains many excellent examples from which the following are selected:

139 State Street, Chicago. The great height of the buildings makes this a difficult subject.

425 Though by no means the most beautiful of the cathedrals of France, Notre Dame has an attraction of its own and makes a splendid subject for the photographer. The picture is so sharp that with a good lens the famous gargoyles can be made out.

442 Lucerne, Switzerland. An unusual photograph of a well-known subject.

458 Cathedral, Milan, Italy. This is an excellent example of Gothic architecture.

483 Kremlin, Moscow, Russia. Note the domes so characteristic of Russian churches.

502 Taj Mahal, India. This is generally regarded as the most perfectly proportioned building in the world.

524 Nankow Pass, China. Note how the inclusion of the caravan has given life and interest to this photograph.

521 Store of Chinese tea merchant. Here again the peddler's display in the foreground is of great value pictorially.

d. Photography Applied to the Factory

150 Assembling room, automobile plant, Detroit, Michigan. Photography is much used for keeping records of the situation in a factory at various times, thus the photograph shown might be taken from the same standpoint at fixed intervals in order to keep the management informed as to the stock of machines in process in this room.

152 Ford plant, Detroit, Mich. Factories often take photographs of their work people and plants for publication in the "house organ" or magazine to which such pictures lend interest.

12 Shoe factory, Massachusetts. Engineers often make photographs of machines and workers; these are frequently used for efficiency studies.

e. Photography Applied to Engineering

313 Great dredge, Montevideo, Uruguay. It is usual to photograph all such important pieces of engineering work as this dredge when they are completed by the maker.

161 Digging ditch with tractor, Wisconsin; 163 Steam shovel at work, Burt mine, Minnesota; 210 Great Roosevelt Dam, Arizona. Contractors often make periodical photographs showing the nature of the work and the progress made.

250, 251, 254 Photographs were taken regularly of the Panama Canal throughout its construction.

f. Photography and the Farm

It is doubtful whether farmers make as much use of photography as they might do; certainly such records as the following would be of use for comparison from time to time.

...supplies. These are good photogra
special crops.

178 Plowing with tractor, South Dakota; 179 Tractor
rows, South Dakota; 332 Tractor drawing harrow
izer, Lima, Peru. Here we see the use of varic
agricultural machines.

185 Hereford cattle, Manhattan, Kan. This splendid ph
stock suggests a regular use of photography for the
making similar records.

g. Photography Applied to Surveying and Map

Photography is much used for record making and eve
surveying, special cameras being used. Much of the Canad
work is done photographically. Photographic records from
have also been of great importance in war, photographs b
daily showing alterations in the positions of defences and gu

394 Every Zeppelin air craft is fitted with specially desigr
graphic apparatus.

426 Airplane on scout duty with French troops, France. Th
used in airplanes are generally hung vertically under
machine and photographs are taken by simply pullir
when the machine is over the desired spot.

248 City of Panama; 25 New York; 435 Madrid, Spain;
District, England; 93 Washington, D. C.; 170 Keol
Iowa; 422 Paris; 489 Bosporus. These show views st
the construction of maps.

h. Alpine Scenery

Alpine scenery with its high lights and deep shadows, and
distances, gives many very interesting photographs.

102 Blue Ridge Mountain scene. This is a remarkable pl
The fruit tree and fence lead the eye to the center

line. The center of interest is, of course, the icy wall in the foreground, its whiteness being in strong contrast to the stone covered surface of the glacier. The picture seems to show the texture of the ice and stone.

275 Illecillewaet Glacier, Canada; 448 Switzerland. As we ascend to high levels, the sky becomes darker owing to its freedom from dust particles which reflect and scatter the sunlight until finally the sky appears dark instead of blue and the white clouds and ice peaks stand out strongly in contrast.

276 Mt. Sir Donald, Canada. The lady in the immediate foreground adds a bit of life and human interest, but is only an accessory part of the picture. The rock wall with the wind swept clouds, the glaciers at the right and left sending down their foaming streams, these make the real picture. Notice how the lines tend to converge, and the angles are softened by the curves of the ice and streams. The lady above the tops of the slender pine trees gives a sense of depth seldom obtained in a picture.

427 Glacier, Chamonix, France. Here we have wonderful lighting effects. The glacier is, of course, the center of value, and yet so many of the lines converge at the point where the house stands that the eye is drawn toward the home.

428 Mer de Glace, Chamonix, France. The notable things in this photograph are the sweeping lines, the lights and shadows. Such a figure as the stunted tree in the foreground emphasizes the bareness of snowy slopes.

444 Lauterbrunnen Valley and the Falls of the Staubbach. This shows a fine scale of gradation. Against the grey walls of the narrow, shadowy valley, the mist of the falling water shines with dazzling whiteness. In the far background the walls open to show sunshine on the snowy mountain and the clouds. The daisies in the foreground and the shining water in the valley serve to bring out strong contrasts.

446 Here is a very clever composition. The Alpine horn in the foreground excites our curiosity and the old man under the tree our sympathy. The eye, however, travels past the men to the rough surface of the glacier and to the mountains. There is a sharp contrast between the grassy slopes and trees in the foreground and the bare mountains farther on. Notice what graceful curves sweep toward the right and what depth is shown.

449 In this mountain scene it will be noticed that there is no sky, the rising ground on the other side of the valley filling the picture. This is very characteristic of pictures taken in hilly country.

508 The Himalayas, Northern India. In some respects this is the most wonderful picture in the "600 Set." Notice first the light which comes from the right gives the glistening whiteness to mountain snows and clouds, in strong contrast to the deep

shadows. The mountains are roughly pyramidal with all lines running off the picture. We catch glimpses of peaks hidden by clouds both before and behind the mountains. The effect of the whole picture is an idea of illimitable space, of depth, and height and distance. We realize that what we see is only a little part of what really is. The leafless branch in the foreground suggests life and emphasizes distance.

i. Tropical Scenes

The lighting conditions characteristic of the tropics are the high, almost vertical, sun, the clear air, and the deep shadows unsoftened by the light scattered from the sky which modifies the shadows of the temperate zone. Since photographic exposures must be such as to record the shadows, exposures in the tropics should be longer than would be judged from the brilliant sunlit portions of the scene, and, indeed, they are generally not less than in temperate climates.

259 Hawaii. Photographs of tropical gardens, while inviting because of the brilliancy of the scene, are apt to be disappointing owing to the absence of the vivid coloring which was so attractive in the original.

301 Jamaica. Such scenes as this are common in Jamaica and make excellent and most interesting photographs.

249 Panama. A very typical scene in the West Indies and Central America, a happy hunting ground for many tourists with their cameras.

302 Coffee pickers, Guadeloupe, F. W. I. In this scene the scale of gradation is very good.

560 The Great Nile Bridge, Egypt. Notice the convergence of line. There is no deep shadow to form contrasts and the center of interest is in the immediate foreground.

572 The native market, Central Africa. This picture should be compared with 560. Instead of the strongly converging lines, the eye begins at the front left-hand corner and travels back through a zigzag line till it reaches the water in the far background. This view has great depth of field.

300 Gros Morne, Martinique, F. W. I. These natives by their position and watching remove the center of interest from themselves to the volcanic cloud. Distance is well shown and the scale of gradation is very fine.

288 The sacred shrine on Cholula Pyramid and "Old Popocatepetl," Mexico.

291 Volcanoes, Guatemala, C. A. The clouds before the mountains emphasize the distance and the height.

j. Natural History Photography

Recently the camera has replaced the gun for many hunters, and instead of killing the wild birds and animals, photographs showing their appearance, natural surroundings, life and habits are made.

588 Kangaroo; 239 Ostriches. Even when animals are in captivity, interesting photographs can be made.

2 Wild moose; 196 A beaver dam; 232 American bison. The most valuable results are obtained when the animals are living in their natural surroundings.

359 A nightingale; 240 Pigeons; 583 Gannets; 584 Penguins. Good photographs of wild birds are difficult to obtain, often demanding much patience and skill on the part of the photographer; sometimes bird photographs are made by means of very long focus, or "telephoto" lenses but many excellent results are secured simply by the exercise of sufficient patience to remain motionless until the opportunity for exposure comes.

539 Silkworm cocoons in their nests, Kiryu, Japan; 209 Desert vegetation, Arizona; 247 Rubber tree, Panama. When photographing such subjects as these the same difficulties do not arise, but nevertheless good photographs of wild flowers or plants growing will often tax the skill and patience of the photographer.

k. Photography for Recording Costumes, Appearance and Habits of the Various Races of Mankind

One of the most valuable applications of photography is to the recording of customs and clothing which soon pass away and would be forgotten but for the photographic records.

98, 158, 168, 182, 204, 265 These records of the North American Indian will be of value when his picturesque dress and interesting customs have long been only a memory of the past.

205 Cliff dwellings, Colorado. Doubtless these relics of the aborigines of the country will be carefully preserved, but photographs enable knowledge of them to be spread to many who could never see the originals.

328 Indians on Magellan Strait; 343 Eskimo girls, Greenland. Everywhere records are being made of such isolated tribes as these.

261 Hula girls, Hawaii; 592 Fiji Islanders. The Polynesian people are fast losing their customs and becoming absorbed, so that these records are of value.

418 Sweden. In western Europe the native costumes are still worn in some places, especially on festal occasions.

402 Holland. Here we see at the same time children in their native dress and also in modern clothes.

471 Roumania; 490 Circassians; 491 Tarsus, Asia Minor; 498 Palestine. As we go towards the East, we find the costumes and habits of the people preserved in their original form.

478 Ruins of Temple of Zeus, Olympia, Greece; 507 Ferryboats, India; 568 Ruins of Karnak, Egypt. These records of the relics of vanished civilizations are very impressive. Note how the photograph brings out the vast size of the colossi in comparison with the men and animals at their feet.

506 Srinagar, Kashmir; 507 India; 519 China; 530 Shizuoka, Japan;

543 Chosen. The East is full of interest for the photographer who finds new subjects at every turn.

l. Astronomical Photography

Photography is the handmaid of many sciences, but to no scientific worker is it of greater importance than to the astronomer; indeed the modern astronomer very rarely observes the heavens with his eye — he almost always photographs instead, merely guiding the telescope by visual observation.

593 The sun naturally requires very short exposures and was the first heavenly object to be photographed.

594, 595 The moon gives the most interesting photograph of any object in the sky and forms a splendid object for the stereoscope.

596 With the planet Mars it is still a matter of dispute as to whether the much discussed "canals" can be shown in a photograph.

597 Saturn with its wonderful ring system makes a marvelous telescopic object and its appearance is well represented in this photograph.

598 The far-away planet Uranus with its moons gives us an idea of the vast size of the solar system.

599 Meteors, or "shooting stars." This stereograph makes the nearness of the meteor, in comparison with the starry background, very apparent.

600 This wonderful picture of a comet, one of those strange wanderers which come to the sun, forms a marvelous stereoscopic object.

44. ARITHMETIC — VISUALIZED PROBLEMS

By JOHN H. WALSH, LL.B., Ph.D.

ASSOCIATE SUPERINTENDENT OF SCHOOLS, THE CITY OF NEW YORK

VISUALIZED PROBLEMS

The teacher fortunate enough to have the stereoscopic pictures will find them invaluable in securing for her arithmetic recitations the interest and motivation so difficult to obtain without these visual aids.

A child is taught arithmetic to enable him in later life to solve the quantitative problems that will constantly confront him as a producer and as a consumer. His aim in the former capacity is to make his earnings as large as possible; in the latter, to use intelligence in his expenditures and in the investment of his savings.

His first arithmetical applications must necessarily be limited to data immediately connected with his personal experiences; his little earnings, and spendings, his recreations, his savings, his tasks, and the like.

The family interests supply data for some of the next series of problems; those, for instance, relating to the family income and outgo, with possible economies, elimination of waste, savings, etc.

As his point of view expands, the arithmetical applications will extend to those involving the relation of the family to the community and that of the latter to the world at large.

The family problems include the expenditures for food, clothing, shelter, education, health, recreation, etc.; the proper ratio of each to the total expenditure; the adjustments needed to meet the increasing living costs with an income that remains stationary or increases at a lower rate than do the expenses.

Among the community problems are those connected with the production of raw materials, their manufacture, transportation, and distribution.

CORRELATING ARITHMETIC WITH OTHER STUDIES

The efficient teacher will have little difficulty in securing problems of every type from the views she uses in her lessons on geography, history, English, etc. By basing the problems of the next arithmetic recitation on one or more of the views recently used, she takes advantage of the interest aroused by the pictures, and gives more meaning to the problems.

The following are some of those that might be given to a class that has recently seen view 167, A Busy Street in Minneapolis:

1 Find the total population of the ten largest cities of Minnesota.
2 What is the difference between the population of Minneapolis and that of San Francisco?
3 The park area of Minneapolis is 400 acres. How many inhabitants are there to each acre of park area?
4 How many inhabitants are there to each acre of park area in the following cities?
   (a) Washington, park area 3067 acres (views 93, 90, 95, 87, 91).
   (b) New York, park area 7713 acres (views 28, 31, 26).
   (c) Philadelphia, park area 5500 acres (views 83, 80).
   (d) Los Angeles, park area 4127 acres (views 238 to 240).
   (e) Chicago, park area 3815 acres (view 139).
5 How many acres of park area should the home city contain to supply its inhabitants with the same amount as is furnished (a) by Minneapolis; (b) by Washington?

In order to accustom pupils to search for the data required to solve a problem, the teacher does not state the population in the preceding examples if the figures are contained in the class geography.

One pupil might be asked to ascertain from a local ticket agent the fare to Minneapolis, to procure the necessary time tables, etc., and to formulate two or more problems.

To another might be given the task of procuring a quantity of wheat and of each of its products: flour, bran, middlings, Graham flour, etc., sufficient to fill a small bottle. Heads of wheat are particularly valuable in a city school, to give meaning to the views illustrating harvesting and threshing (views 177, 218, 233, 199, 357).

6 (View 242) If a submarine runs 9 miles per hour under water for 7 hours and 12 miles per hour above water the remainder of the 24 hours, (a) how many miles has it made in a day? (b) At this rate, how long would it take to travel 3738 miles?
7 (View 394) (a) An airship remains in the air 58½ minutes.

How many minutes is that less than an hour? (b) If an airship goes 70 miles in one hour and 65 miles the next hour, how many miles does it go in 2 hours?

8 (View 178) After plowing 24 acres for wheat, how many more acres will this farmer have to plow to finish 45 acres?

9 (View 153) (a) How much will this laborer earn in a day of 8 hours if he fills five barrels per hour at 7¢ per barrel? (b) How many barrels of 280 lbs. each can be put in a freight car whose capacity is 56,280 lbs.?

10 (View 76) If a miner earns $112.50 per month and his expenses are $83.75 per month, how many dollars can he save (a) in 1 month? (b) In 1 year? (c) In 2 years?

11 (View 199) When a 6-acre field yields 95 bushels of wheat, what should be the yield of an 18-acre field?

12 (View 127) (a) What does a man gain if he buys a cow for $87 and sells it for $90? (b) If the man on horseback rides 4 miles per hour, how far does he ride in 8 hours? In 12½ hours?

13 (View 551) A Filipino has 62 coconut trees and 53 banana trees. How many more coconut trees has he than banana trees?

14 (View 276) If the stream is 5000 feet away and the first tree below the woman's foot is 125 feet high, how many trees laid end to end would it take to reach the stream?

15 (View 117) (a) If each basket holds 8 lbs. of cotton lint and 8 lbs. of seed, how many baskets full will it take to make a bale of 496 lbs. of lint? (b) If an expert picker gathers 2 baskets of cotton per hour, how many baskets will he pick in 8 hrs.? How many pounds?

16 (View 119) After selling one-half of his crop of cotton, Judge Wilson has 324 bales left. Of how many bales did the crop consist?

17 (View 564) If the jar the woman carries holds 12 quarts of water, how many trips must she make to carry 8 gallons to her house?

18 (View 504) If a merchant has 4 camels in his caravan, each carrying a load of 425 lbs., (a) how many lbs. of merchandise can he transport? (b) What will he receive, if he sells 114 rugs for $7.28 each, 228 lbs. of spices at 32¢ per lb., 352 lbs. of ivory at $1.08 per lb. and 736 lbs. of palm oil at 12¢ per lb.?

19 (View 565) If the camel travels 6 miles per hour each night of 8 hours across the desert, (a) how many nights will it take to cross, if the desert is 354 miles wide? (b) How far will be the first oasis if it takes three nights travel to reach it?

20 (View 108) (a) If one basket holds 15 pineapples, how many will six baskets hold?
(b) If each man gathers 9 baskets of pineapples per hour, how many baskets full will the six men gather in 8 hours?

21 (View 22) If it takes 2700 cocoons to make a pound of silk

fiber and each cocoon produces 1000 ft. of fiber, how many feet of fiber in 560 lbs. of raw silk? How many miles?

22 (View 294) How many bananas are 7 dozen bananas?

23 (View 509) (a) If the elephant drags out 7 logs per hour for 8 hours each day, how many will he drag out in six days? How many in a month of 31 days, not counting 4 Sundays? (b) How many tusks have two elephants? How many feet have three elephants?

24 (View 471) A chain was cut into three pieces, 42, 63 and 24 feet long. What was the length of the original chain?

25 (View 357) When 18 acres yield 276 bushels of wheat, what should be the yield of 6 acres?

26 (View 38) A man owns 100 acres. How many acres has he after he buys 24.2 acres and sells 48.45 acres?

27 (View 470) If 2 trains per hour pass over this bridge, how many will pass over in a day? In a year of 365 days?

Related Problems

Further advantage might be taken of view 167 to base a few problems on its leading industry, the manufacture of flour:

28 When a bushel of wheat, 60 pounds, yields 73% of its weight in flour, (a) how many pounds of flour are made from a bushel of wheat? (b) How many pounds are left as bran, middlings, etc. (Views 177, 199, etc.)

29 (a) How many bushels of wheat are required to make a barrel of flour at the foregoing rate? (b) What is the value of this quantity of wheat at the prevailing price? (c) If the miller pays 50¢ for the barrel, how much do the wheat and the barrel cost? (d) Find the cost if he uses 2 bags at 17¢ each instead of a barrel.

30 If the home town is not on a main line to Minneapolis, (a) find from the time table, the distance to the nearest city at which connection may be made with a direct train to Minneapolis. (b) Find the time required for this journey. (c) How many miles per hour does the train travel?

31 Find (a) the number of miles to Minneapolis from the connecting point, (b) the time required for this part of the trip, (c) the rate of speed.

32 Find the total expense of a trip to Minneapolis, including meals, etc.

Problem Material

If certain views are assigned by the teacher, she should examine her text-book for related problems, adapting the conditions to the grade of the pupils.

The problems suggested in connection with view 167 indicate the variety of types of problems that may be employed in connection with a city view.

These types include applications to population, manufactures, recrea-

tion, travel, etc., which can readily be modified to apply to any other city.

The travel types are applicable to any city, especially to such as pupils may be interested in visiting: for instance, Boston views 6 to 8; New York views 25 to 31; Buffalo view 48; Niagara Falls views 49, 50; Pittsburgh view 61; Philadelphia views 80 to 84; Washington views 87 to 95; Oklahoma City view 121; San Antonio view 126; Chicago view 139; St. Louis view 174; Salt Lake City view 212; Seattle view 220; San Francisco view 230; Panama view 248; Quebec views 264, 266; Montreal view 267; Winnipeg view 273; Vancouver view 277; Vera Cruz view 280; Mexico City view 282; Rio de Janeiro view 305; London views 348 to 352; Berlin views 383 to 385; Paris views 421 to 425; Rome views 450 to 452; etc. The cost of a week's stay might occasionally be included, especially in the case of Atlantic City (view 60); Lookout Inn (view 114); Riffelburg Hotel (view 448).

Numerical Data from the Views

The teacher is careful to look over the reading matter on the back of each view for any available data it may supply. The latitude and longitude being given on the back of each stereograph in the Keystone "600 Set" gives a fine opportunity for making many problems on longitude and time (read description on back of view 353).

33 (View 353) The longitude of New York is 79° W. (a) When it is 3 o'clock P. M. at Greenwich, what time is it in New York City?

(b) What time in Washington, D. C. (see view 87 for longitude).

34 (View 95) How many acres are covered by a building 470 feet long, 340 feet wide?

35 (View 84) How many cents are there in a half dollar, a quarter, a dime, a nickel? How many mills?

36 (View 94) How many dollars would a person have if he had one bill of each of the following denominations: $10,000, $5,000, $1,000, $500, $100, $50, $20, $10, $5, $2, $1?

37 (View 578) (a) If a native covers 25 miles in a day, how many days will he require to make a journey of 650 miles?

(b) How many pounds are carried by a safari of 23 men at 60 pounds per man?

(c) What does a man receive for a trip of 650 miles if he is given $1.75 in money, 6 pounds of mealies worth 10¢ a pound and 5 yards of muslin worth 15¢ a yard?

38 (Views 575, 576) How many feet in ⅛ mile?

39 (View 561) How many cubic feet of water will cover an acre, 43,560 square feet, to the depth of an inch (1/12 ft.)?

40 (View 16) How many bales of cloth of 35 yards each are made in a day in a mill that turns out 5,000,000 yards in a week of 6 working days?

Mental Problems

Whenever possible the problems should be "mental." The data need not be given when they are supplied by the card.

41 (View 156) How many tons of copper are produced annually (a) in the United States? (b) In Michigan?

42 (View 173) In 1915, what was the average production of wool to a sheep?

43 (View 176) What was the value in 1915 of each ton (a) of crude zinc produced in the United States? (b) Of each ton of lead?

Types of Interest to Pupils

Children are not always interested in statistical problems or in those employing very large numbers. A good plan is to assign as home work the bringing in of a problem based upon a given view. Each pupil supplies conditions, figures, and the result. Very often one is presented which the teacher finds worthy of a place on the wall or blackboard or even in her notebook. A foreign pupil may be helpful in suggesting one that would not be likely to occur to the teacher, as in foreign moneys, or weights and measures.

Another plan is for the teacher to furnish merely the conditions of the problem and to have each pupil supply his own figures.

In this and other ways the teacher discovers some types of problems likely to interest her pupils, and selects these as she finds them.

Boys' and Girls' Clubs (View 83)

An interesting type of production problem is one in which a school child is the producer.

Even city pupils should be interested in the efforts made by county, state, national, and other organizations to increase production throughout the country especially with one-half the world looking to America for food.

A bulletin of the U. S. Department of Agriculture contains the following statements: "For no ten-year period has the corn yield of the United States exceeded 28 bushels per acre. No state has averaged for any year over 54 bushels per acre, yet in practically every section of the United States yields of more than 100 bushels have been produced."

Hundreds of boys have obtained from a single acre more than 100 bushels. Their success must necessarily spur on their seniors to strenuous efforts to increase the yield.

Among the problems of the Boys' Corn Club the following may be introduced: (See views 180, 184, 136, 137).

44 (a) How many square feet are there in an acre? (b) What is the width of a plot 240 feet long that contains an acre? (c) How many rows 3.3 feet apart are there in 181.5 feet? (d) How many stalks 20 inches apart will there be in a row 240 feet long? (e) How many stalks are there in 54 rows each containing 143 stalks? (f) How many bushels of corn at 56 pounds to the bushel are there in 7722 stalks, if each stalk averages 1 pound of grain?

45 How many cubic feet in a bin of sufficient capacity to contain the yield of a boy's acre that makes 156 bushels?

46 Find the cost of each of the following operations for 40 acres, allowing $2 per day for a man and $1.50 for a team:

(a) Disking at the rate of 6⅔ acres per day for man and team.
(b) Plowing — 2 acres per day.
(c) Harrowing twice — 10 acres per day for each.
(d) Rolling — 13⅓ acres per day.
(e) Seeding — 10 acres per day.
(f) Spreading manure — 1 acre per day.
(g) Cultivating, 3 times — 6⅔ acres per day.
(h) Harvesting — 6⅔ acres per day.

47 (Views 184, 137) Find the cost of tying and shocking 40 acres at the rate of 3⅓ acres per day per man.

48 (a) at 86 bushels to the acre, what is the yield of 43 acres?
(b) Find the cost of husking at 50 bushels per day per man.

Other Crops

Applications to other crops may be made by using the preceding figures for the cost of preparing the seed bed (view 179); disking, plowing, harrowing, rolling, and fertilizing, and substituting the following for those given for harvesting, tying, and husking:

Drilling wheat, 8 acres per day for man and team.
Binding, 10 acres, man and three horses (view 357).
Shocking, 10 acres per man (view 199).
Stacking, 6⅔ acres, man and 2 horses.
Threshing 1000 bushels per day (view 177), 12 men and 8 horses. (The yield of 40 acres at 25 bushels to an acre.)

In seeding oats (view 147) 1 man can do 13⅓ acres per day, 1 man can shock 8 acres, 12 men and 8 horses can thresh 1800 bushels, the yield of 40 acres.

The number of cows that a man can milk per hour (view 57) may be taken as 8; he can pick 40 bushels of apples per day (view 175).

School Gardens (View 83)

Many pupils of rural and suburban schools, in connection with which there is a school garden, are encouraged to obtain at home a small plot for their individual use.

For city pupils, a series of problems connected with the possibilities of backyard vegetable gardening should be valuable and interesting.

Make a diagram of a plot to contain, say, 12 rows 1 foot apart and 4 rows 2 feet apart. The last four are intended for tomatoes, the plants to be 18 inches apart. The others are for lettuce and beans, 6 inches between the plants; beets, 4 inches between the plants; and radishes, 2 inches between the plants. On every line representing a row, place a cross (X) to show the location of a plant, the first and the last being located at a distance from the border equal to one-half the space between the plants. Outside the plot indicate a path 1 foot wide. Assuming the rows to be 6 feet long, some questions might be

49 (a) How many radish plants, 2 inches apart, are there to a 6-foot row, when the end plants are 1 inch from the boundary? (b) How many lettuce and bean plants, 6 inches apart, when the end plants are 3 inches from the boundary? (c) How many tomato plants, 18 inches apart, when the end plants are 9 inches from the boundary?

50 (a) If radishes are sown on March 29, how many days have elapsed until April 30, the day the first radish is picked? (b) Between May 15, the date of the planting of the beans, and July 14, the date of the first picking? (c) If tomatoes are set out May 25, and some were ready for the table in 135 days, at what date were they ready? (d) If lettuce plants mature in 40 days, when should those mature which were set out on April 3? (e) Beets (view 198) require 70 days; at what time should some of those sown on April 6 be ready for gathering?

Other problems might be suggested by the pupils as to the returns from a patch of the given size, also as to possible crops obtainable from the first twelve rows by following the first ones with spinach, which may be sown up to September, and maturing in 45 days; turnips sown in August, and maturing in 65 days; beans planted in June, and maturing in 60 days.

For Larger Plots

The following data are given to supply materials for problems to be used in connection with views 47, 137, 149 and 469:

	(view 47) Cantaloupe	(view 137) Pumpkin	(view 149) Celery	(view 469) Beets
Time of planting	May, June	May, June	April, July	Mar., July
Distance between rows	6 ft.	8 ft.	42 in.	3 ft.
Between plants in row	6 ft.	8 ft.	6 in.	2 ft.
Ready for use in	105 da.	115 da.	135 da.	110 da.
Yield per 100 ft. of row	80 melons	30 pump.	150 stalks	40 beets.

Problems of these types may be used in connection with market scenes, of which there are many, for instance, views 7, 387, 393, 395, 423, 447, 469, 485, etc.

Canning Clubs

Many of the girls of a rural school are members of a canning club, each cultivating one-tenth of an acre, say, of tomatoes. A portion of the crop is canned at the school as a part of the course in Domestic Science.

51 (a) How many square rods in $\frac{1}{10}$ acre? (b) How many rods in each side of a square patch containing $\frac{1}{10}$ acre? (c) How many feet?

52 Assuming that it takes 4 pounds of tomatoes to a quart can, (a) how many cans may be filled from 3000 lbs.? (b) Find the cost of the cans at $18 per thousand. (c) Of the labels at $1.50 per thousand. (d) Find the cost of shipping the cans to the nearest

town. (e) Calculate the receipts after deducting 20% commission of the retail price obtained by the dealer.

Other applications may include home preserving, drying, jellymaking, etc., from data obtained by the pupils.

A silo may be considered a type of can on a large scale, in which green food is stored for winter use. A pupil that has seen view 165 will handle with more interest the problem requiring the capacity of a silo than one who has seen neither a silo nor its picture. For a lower grade a rectangular silo may be substituted for the cylindrical one of the illustration.

53 (View 165) Find the capacity of a cylindrical silo 21 feet in diameter and 35 feet high.

Among the views relating to the preservation of food for later use the following may be mentioned:

View 13, Drying codfish; view 160, Harvesting silage corn; view 237, Canning salmon; view 244, Drying salmon; view 531, Drying sardines.

To the canning applications may be added some relating to the drying of vegetables and fruit. The following data are suggested:

	Selling price at drying plant.	Weight after drying.	Cost of drying.
Celery	$30 per ton	150 lb.	$10 per ton.
Cabbage	8 per ton	175 lb.	8 per ton.
Carrots	12 per ton	200 lb.	10 per ton.
Onions	2 per bu.	5 lb.	.10 per bu.

The problems might cover (a) the cost per pound of the dried product, (b) the percentage of loss in weight by drying, etc.

54 (View 175) (a) Find the price of a barrel of apples to the consumer when the farmer gets $2.50, the local agent is paid $.25, the freight and refrigeration cost $.35, the receiving agent gets $.15, the cost of cartage to jobber $.05, jobber's profit $.25, retailer's profit $1.25, delivery to consumer $.25. (b) Find the amount obtained by "evaporating" the apples, yielding 20 pounds of dried fruit at 8 cents per pound and 10 pounds of waste at $2 per hundredweight.

55 (View 149) If a Kalamazoo celery field contains 26 rows 300 ft. long and the plants are 6 in. apart, (a) how many stalks will it produce? (b) What does the farmer realize from the crop at 2¢ per stalk? (c) How many crates of 15 dozen stalks each are produced on the field? (d) If the consumer pays 5¢ per stalk what percentage of the retail price does the farmer realize?

Boys' and Girls' Poultry Clubs (View 56)

To encourage poultry raising and the improvement of the breed in a county, a poultry association gives children two settings of Leghorn eggs each. The child agrees to pay in a year either $2 with interest at 6%, or 4 chickens that have been raised from the eggs, or 4 settings of eggs from these chickens.

Dec.	291 eggs	Apr.	577 eggs		
Jan.	380 eggs	May	536 eggs	Sept.	
Feb.	495 eggs	June	537 eggs	Oct.	
Mar.	693 eggs	July	510 eggs	Nov.	

(b) How many dozen were laid by the flock? (c) average to the hen? (d) What was the average per dozen if the total receipts were $120? (e) I if the food cost $1.90 per hen and the labor, etc.,

Boys' Pig Clubs (View 183)

County associations in various sections indorse the r who wishes to fatten a pig. The boy obtains the money bank, to be repaid with interest at 6%.

58 John Smith bought a pig for $5 on Dec. 18, giving took up the note on the following May 6. (a) H elapsed? (b) What was due with interest?

59 The pig weighed 43 pounds when bought, and 182 sold. What was the gain per day?

60 (View 142) He obtained $9.65 per hundred pound tened pig. What did he receive?

61 (a) Find the cost of feed as follows:

8	bu. shelled corn	@	$ .75
3½	bu. ground barley	@	.65
¼	ton shorts	@	26.00
⅖	ton tankage	@	55.00

(b) What sum did he receive for his labor?

62 (Views 172 and 183) Another boy bought a pig used alfalfa instead of a portion of the corn; his pounds per day at the same expense for feed. As his pig for 140 days, and obtained $9.75 per hundr would be his profit after paying the note with ir

Grading the Problems

the view can be used as the basis of a bill. One appropriate to views 58 and 59 might contain some of the following items:

100 doz.	Tea cups #4982	$1.05
100 "	Saucers	.78
43 "	Dishes 6" #4993	1.80
19 "	Dishes 10"	4.25
8 "	Dishes 12"	7.09
16 "	Celery Trays	5.40
30 "	Double egg cups	1.58
141 "	Fruits 4" #4995	.72
78 "	Fruits 5"	.90
70 "	Plates 7" #4996	1.58

A low grade might have fewer items, a high grade might include a discount of 2% for cash.

The teacher will occasionally desire an upper grade problem that will illustrate several views.

63 (View 165) (a) Find the cubical contents of a cylindrical silo 14 feet in diameter (interior), when filled to a height of 30 feet. (b) Find the weight of the contents at 40 pounds to the cubic foot. (c) (View 57) When a cow is fed 35 pounds per day, how many cows will it supply for 176 days? (d) (View 160) At the rate of 14 tons to the acre, how many acres of ground will supply the fodder needed to fill the silo to the height of 30 feet?

64 (View 544) If it takes 14 days to go from Petrograd to Vladivostok, 6000 miles, how many miles does the train go (a) in a day? (b) In an hour? (c) How long would it take this train to make a 900-mile trip?

65 (View 43) If a train goes 900 miles in 20 hours, (a) how many miles does it travel in an hour? (b) What is the fare at the rate of 2¢ per mile plus $1 per hour for every hour less than 28? (c) How many hours would a trolley car require at the rate of 15 miles per hour? (d) How fast does an aeroplane travel (view 426) that covers the distance in 12 hours?

Some Correlations

When the arithmetic teacher has at hand no figures directly connected with a view, she uses some of those most nearly related.

In connection with lumbering (views 1, 162, 224, 509) she may use a building problem of this kind:

66 How many laths are required for 100 sq. yd. when 1 lath is needed for a space of 4 ft. by 2 in., and no allowance is made for waste?

67 How many shingles are required to the square foot when each covers a space (a) 4" x 4"? (b) 4" x 5"?

The text books contain a number of examples which treat of boards, shingles, rafters, etc., which may be used in connection with lumber views 216 and 217. The following is a combination type:

68 Find the total cost of the materials required to lath and plaster 100 square yards, at the following quantities and prices:

10 bushels of lime at 40¢ per bushel.
1½ cubic yards of sand at 75¢ for 1¼ cu. yd. (view 223).
2 bushels of hair at 40¢ per bushel (view 272).
100 pounds of plaster of Paris for 50¢.
1400 laths at $2.75 per M.
10 pounds of nails at 14¢ per pound.

Views 3 and 4 in connection with view 95, give rise to a variety of problems in finding the contents of walls and the like.

69 (View 3) (a) Find the contents of a granite block 7 feet each way. (b) How many cubic feet are there in the largest cylinder that can be made from the block? (c) How many square feet of surface?

Views 117, 124, 125, 119, 286, 14, 15, 16, Cotton; 268, 269, 40, Linen; 190, 145, 17, 18, 81, Wool; 536 to 541, 22, 23, 24, 53 to 55, Silk; give rise to problems relative to the cost of a square yard of calico dress goods (cotton), linen, woolen and silk. The pupils will suggest applications and figures.

Stocks and Bonds problems come naturally in connection with view 29, Wall St., view 351, Bank of England, and view 590, Union Bank of Australia. The text-books contain quite a number.

A bill for a purchase of sugar might be made out in connection with views 34 and 35, in the absence of other numerical applications.

70 (Views 11, 41, 12) Find the cost of each of the following items in the manufacture of a pair of shoes:

(a) Upper leather 2¾ sq. ft. at 28¢ per sq. ft.; other materials 13¢.

(b) Insole, 16¢; counter, 2¢; outsole, 26¢; heel, 10¢; toplift, 6¢.

(c) Find the cost of the materials including 27¢ for items not specified above.

(d) Find the total labor costs in the cutting at 13½¢, stretching at 17¾¢, lasting at 6¼¢, finishing at 8½¢, treeing at 7½¢ and packing at 6½¢.

(e) Find the total cost to the manufacturer, including 30¢ per pair for such other expenses as rent, heat, light, commissions to salesmen, etc.

(f) If the manufacturer sells them for $3.00 per pair, his profit is what per cent of the selling price?

(g) Of the cost?

71 The retailer receives $4.50 per pair for these shoes. (a) What per cent of the cost does the retailer add? (b) If the retailer's selling expenses are 20% of the price he receives for the shoes, what is his profit per pair? (c) What per cent of the selling price?

72 At 55 hours per week, (a) what did the average woman treer receive per hour when her weekly earnings were $8.80? (b) The average woman vamper, with weekly wages of $13.75?

73 The wages of men workers ranged from $14.85 for assemblers to $27.50 for welters. Find the hourly rate for each at 55 hours to the week.

74 A woman packer receives $1.75 per day. (a) What would be her yearly earnings for 300 working days? (b) What would she receive if she lost 20 full days and 20 half days?

75 (View 40) (a) Find the cost of the labor on a dozen of collars when the cutting costs 3¢, the sewing 23¢, and the laundering 12¢.
(b) Find the cost of the materials per dozen, including ½ yard of linen at 34¢ per yard, 1⅓ yards of muslin at 10½¢ per yard, ¾ cent for findings, and 2¼¢ for box; less ½¢ discount.
(c) Find the cost per dozen, adding to the foregoing 5¢ per dozen factory expense, and 21½¢ selling expense.
(d) What is the profit per dozen to the manufacturer if he sells them for $1.03 net per dozen?
(e) What does the retailer receive per dozen when he sells them at 2 for 30¢?
(f) What is his profit when he sells one each at 15¢ to six customers and the other six at 2 for 25¢.

Problems such as the following give an opportunity for comparing the comparative costs of silk (views 53, 54), wool (views 18, 81, 409), and cotton (views 286, 16, 563) used in shirts made in the Troy collar factory (view 40), which also makes shirts.

76 The following gives the sex and the nationality of the employees in a Troy factory:

Nationality Foreign		Male	Female	Total	Per cent
Russian	(view 486)	43	57	(a)	(g)
Italian	" 454	22	42	(a)	(g)
Austrian	" 462	8	12	(a)	(g)
Irish	" 374	2	13	(a)	(g)
English	" 347	1	8	(a)	(g)
Hungarian	" 464	3	5	(a)	(g)
German	" 386	2	5	(a)	(g)
Bulgarian	" 469	2	4	(a)	(g)
Roumanian	" 471	1	5	(a)	(g)
Servian	" 467	3	1	(a)	(g)
Bosnian	" 466	..	3	(a)	(g)
Others		4	5	(a)	(g)
Total foreign		(b)	(b)	(c)	(h)
Native born		36	214	(d)	(h)
Grand total		(e)	(e)	(f)	(i)

Complete the table, giving (a) the foreign totals by nationality; (b) the foreign totals by sexes; (c) the foreign total; (d) the total of native born workers; (e) the grand totals by sexes; (f) the whole

number of workers; (g) the per cent of (f) by nationalities; (h) the per cent of foreign born and that of native born workers.

Making Garments, and Americans — A Factory School

A factory, some of whose women workers are recent arrivals at Ellis Island (view 32) from Germany (view 388), Galicia (view 365), Russia (view 488), Italy (view 455), Roumania (view 471), etc., permits the latter to attend the factory school for 45 minutes per day, paying them 17 cents per hour for time spent in the classroom.

No text-books are used, the teacher depending upon the stereoscope and the lantern to supply matter for her oral instruction in geography, history, patriotism, and citizenship, together with the evolution of the material on which the pupils are working, tracing the cotton from the plantation (view 117), to the gin (view 125), to the wharves (view 119), the carding room (view 286), etc., etc., until it finally reaches the factory machines in its finished form.

The arithmetic problems deal with the girl's earnings, her spendings, and her savings; the making out of a work slip; the keeping of personal accounts, etc.

77 Find (a) the weekly earnings of a girl at 19½¢ per hour for 50 hours. (b) The earnings for 35 weeks at that rate before attending school.

78 Find (a) the total amount earned by a girl while attending school:

4	weeks,	averaging	20¼	cents	per	hour,	50	hours	per	week
8	"	"	21¼	"	"	"	"	"	"	"
8	"	"	22¼	"	"	"	"	"	"	"
8	"	"	23½	"	"	"	"	"	"	"
7	"	"	24½	"	"	"	"	"	"	"

(b) The average per week for 35 weeks.
(c) The average per hour.

79 How much more was earned (a) by each girl during the 35 weeks she attended school than during the 35 previous weeks? (b) By the 40 girls that attended, assuming the increase to be the same for each?

80 The literate employees averaged 23½¢ per hour during 70 weeks. (a) How many weeks did the illiterate take to reach that rate? (b) How much more did each of the latter earn in the last 7 weeks than each of the former?

81 One section of 40 girls attended school 2 periods per week of 45 minutes each. (a) How many hours did they attend in 35 weeks? (b) What did it cost the owner of the factory to pay the girls' wages for this time, at 17¢ per hour? (c) Find the cost of the following for 35 weeks at the weekly rate of $5 for floor space, $3 for light, heat, etc., $1 for janitor's services. Find the expense per girl (d) for 35 weeks. (e) Per week.

The advantages to the girls and to the city cannot be estimated in the terms of dollars and cents, but the factory books indicate that the owner's profits on these 40 girls were increased 2¢ per hour.

82 Find the increased profit on the labor of 40 girls for 35 weeks of 50 hours each at 2¢ per hour.

83 How much does this exceed the owner's outlay for the wages of 40 girls for 1½ hours per week for 35 weeks and the other expenses of $9 per week?

Other Manufacturing Problems

84 What is received for the milk of a Jersey cow (view 364) that averages 25 pounds daily for 308 days, containing 5.3% of butter fat worth 28 cents per pound?

85 The expense of keeping this cow included 3.5 tons of hay at $7 per ton, 1200 pounds of ground feed at 90¢ per 100 pounds, and pasture worth $8. (a) Find the total expense. (b) How much less is this than the sum received for the milk?

86 An Ayrshire cow (view 371) gives 9000 pounds of milk in a year, from which are produced butter (view 45) amounting to 5% of this weight, skim milk amounting to 80%, and buttermilk amounting to 15%. Find the value (a) of the butter at 32¢ per pound. (b) Of the skim milk at 16¢ per 100 pounds. (c) Of the buttermilk at 12¢ per 100 pounds.

87 From the farm to the table the following successive losses occur in the weight of a cow weighing 1000 pounds on leaving the ranch (view 127):
5% during transportation to the stockyards (view 140) (a)
42% of the remainder in killing and dressing (view 141) (b)
10% of the remainder in cooking (c)
25% of the remainder in bones and in fat not eaten (d)
Find the successive remainders (a), (b), (c), and (d).

88 (Views 172, 142) (a) Find the weight of a 200-lb. hog after it loses 20% in dressing. The hams (view 143) weigh 12½% of the dressed weight. (b) Find the weight of a ham. The lard constitutes 20%. (c) Find its weight. The shoulders and the sides of bacon weigh the same as the hams. (d) Find the weight of the remainder: head, feet trimmings, loins, etc.

Some Transportation Problems

89 (View 518) A bushel of salt (1¼ cu. ft.) weighs 55 pounds. Find the weight of a wheelbarrow load of 2¾ cu. ft.

90 (View 138) A team of horses weighing 3000 pounds can pull a 1000-lb. wagon and a 2000-lb. load on a dirt road. How many pounds should a Percheron team, weighing 4000 pounds, draw in the same wagon on the same road?

91 On a smooth pavement a 3000-lb. team can draw a total weight of 5000 pounds including wagon and load. What should the Percheron team draw on the same road in the same wagon?

92 A finished road consists of 3 inches of fine broken stone (view 3) laid on 12 inches of coarser material. If the roller (view 516) compresses it into ¾ of the space it occupies when loose, how many inches of each material must be used?

[illegible] 8 miles to a railroad station at the r
ton per mile? (b) What is saved in the transp
bales when the improvement of the road reduc
12¢ per ton per mile? (View 124.)

Miscellaneous and Supplementary Problem

96 (View 183) Find in the table below the cost of eac
(a, b, c, d) fed to 2 Poland China pigs by the girl
club prize; also (e) and (f):
(a) 420 lb. ear corn at 60¢ per bushel of 70 lb.
(b) 200 lb. middlings at $1.50 per 100 lb.
(c) 1680 lb. skim milk at 25¢ per 100 lb.
(d) Pasture for 83 days at 15¢ per month.
(e) Gain per day at 332 lb. for 83 days.
(f) Cost per 100 pounds of gain.

97 (View 172) The pig of a boy member of the sar
sumed the following in 72 days. Find the cost of
(a) 224 lb. ground corn at 60¢ per bushel of 56
(b) 90 lb. of ground wheat (inferior) at 80¢ p
60 lb.
(c) 600 lb. skim milk at 25¢ per 100 lb.
(d) Pasture for ⅛ year at $3.60 per year.
Find (e) the daily gain, if the total increase in weig
(f) The cost per 100 pounds of increase.

98 (Views 150, 151) Find the expense of a 3-ton truc
of 300 working days, averaging 50 miles of actual
day.
(a) Depreciation, 15% of $2800, its cost.
(b) Interest, 5% of cost.
(c) Labor, 300 days at $3.
(d) Tires, $400; overhauling, $200; current repa
(e) Cost of gasoline at 25¢ [illegible]

his road. (a) What is his yearly saving? (b) What interest is this on his increased yearly tax of $25 levied to pay for the improvement?

101 (Views 310, 311) A dealer bought 1000 bags of coffee, weighing 130 pounds each, at 12.42¢ per pound and paid 4¢ brokerage per bag. (a) Find the cost of the coffee. (b) The cost of roasting at 1½¢ per pound. (c) The total cost. (d) The weight after roasting if the coffee loses 15% of the original weight. The roasted coffee is packed into bags holding 100 pounds each. (e) How many bags are needed? (f) Find the cost of the bags at 18¢ each. (g) How much more is this than the price received for the original bags, 8¢ each?

102 (Views 115, 325) A fertilizer contains 10 parts of nitrate of soda, 17 of kainit, and 53 of phosphate. How many pounds of each are there in a ton?

103 (View 83) Find (a) the profit made on a tenth of an acre of tomatoes, when the land rent is $1, labor $3, staking and pruning $2, fertilizing $2.50, cans $36, canner $5, cost of canning $10, and the output 1200 cans at 8¢ per can. (b) Find the per cent of profit.

104 (View 44) Spraying materials usually cost as follows: Lime 1 cent per pound; copper sulphate 10 cents per pound; Paris green 30 cents per pound; arsenate of lead 15 cents per pound; kerosene 13 cents a gallon; hard soap 10 cents per pound; lime-sulphur mixture 15 cents per gallon.

(a) Find the cost of the following formula:
5 pounds of lime
3 pounds of copper sulphate
50 gallons of water

(b) Find the cost of the following formula:
2 gallons of kerosene
1 pound of hard soap
1 gallon of water

(c) Find the cost of the following formula:
3 pounds of arsenate of lead
50 gallons of water

105 (Views 47, 166) If it takes three applications of 2 pounds of arsenate of lead and three days' time at $1.25 per day, to destroy the Colorado beetles on an acre of potatoes, how many bushels of potatoes at 50¢ per bu. will be required to pay for the treatments?

106 (View 117) A farmer plants an acre to cotton three years in succession, using 400 pounds of fertilizer each year (views 115, 325). The first year the acre produces a bale, the second year five-sixths of a bale, and the third year two-thirds of a bale. What is the income for the three years if cotton sells at 12¢ per pound and seed at $20 a ton? (A bale of lint weighs 500 pounds; the seed of a bale 1000 pounds.)

107 The same farmer plants another acre, using the same amount of fertilizer each year, to cotton the first year, and makes a bale; to corn and peas the second year, and produced 75 bushels of corn and 10 bushels of peas; to oats and peas the third year, and produces 40 bushels of oats and 15 bushels of peas. Find the value of all the crops if corn is worth 75¢ per bushel, cotton the same as in problem 110, peas $1.50 a bushel and oats 50¢ per bushel.

108 (View 161) Field tiling costs about as follows: Three-inch 3¢ per foot; 4-inch 4¢ per foot; 5-inch 5¢ per foot; and 6-inch 6¢ per foot. Find the cost of 500 feet of each.

109 A man owns a plat of swamp land 48 rods longs and 10 rods wide.

(a) Find its area in acres.
(b) There is a small stream running through the middle of the plat lengthwise. To drain the plat into the stream it requires 4-inch tiling laid 3 feet deep every 4 rods. Find the cost of tiling to drain the plat.
(c) It costs 12½¢ a rod to dig the ditches. What will the ditching cost?
(d) What will the system of drainage cost in (b) and (c)?
(e) The plat has been producing 2 tons of hay (view 181) valued at $10 per ton. How many bushels of corn (view 184) per acre will the plat now have to produce the first year to pay for the drainage system and make a return equivalent to the usual income from the hay crop?

Governmental Problems

In connection with such views as 32 Immigrants landing; 99 Life saving corps; 242 Submarine and torpedo boats; 254 Battleship — Panama Canal; 266 Military parade, Quebec; 385 Cuirassier guards, Berlin; 426 French troops; 476 Grecian soldiers; 585 Review of troops and with many others showing governmental buildings, problems involving taxes, duties, postage, etc., might be employed, the pupils thus realizing the Government's need of money.

110 The following shows the items of one type of a soldier's daily ration, with the cost of each to the government delivered at one of its posts. (a to q) Find the cost of each item, giving the results in cents to four decimal places. (r) Find the cost of the entire ration. (s) Its total weight, taking the weight of a pint of vinegar as 1 lb., and that of a pint of sirup as 2 lb.

(a) 16 oz. bacon at 24¢ per pound.
(b) 18 oz. flour at 2¾¢ per pound.
(c) .08 oz. baking powder at 9.7¢ per ½-lb. can.
(d) 2.4 oz. beans at 3.88¢ per pound.
(e) 20 oz. potatoes at 1.47¢ per pound.
(f) 1.28 oz. prunes at 5.94¢ per pound.
(g) 1.12 oz. coffee at 14.75¢ per pound.

(h) 3.2 oz. sugar at 4.165¢ per pound.
(i) .5 oz. evaporated milk at 6.67¢ per 8-oz. can.
(j) .02 pt. vinegar at 14.9¢ per gallon.
(k) .64 oz. salt at .65¢ per pound.
(l) .04 oz. pepper at 4.42¢ per ¼-lb. tin.
(m) .014 oz. cinnamon at 15¢ per ¼-lb. tin.
(n) .64 oz. lard at 12.98¢ per pound.
(o) .5 oz. butter at 31.8¢ per pound.
(p) .04 pt. sirup at 25¢ per gallon.
(q) .014 oz. lemon extract at 30¢ per 8-oz. bottle.

111 Find the cost of rations for 1000 soldiers for 30 days.

112 Find the cost of rations for 1,000,000 soldiers (a) for one day, (b) for 365 days.

113 (View 100) Find the weekly cost of the following items of a United States Navy ration:

Allowance Per Day

1¾ lb. meat	@ 12¢	⅛ lb. coffee	@ 16¢
1¾ lb. potatoes	@ 1½¢	1/16 qt. milk	@ 8¢
1¼ lb. bread	@ 4¢	¼ lb. sugar	@ 6¢
9/16 lb. apples	@ 2¢	⅛ lb. butter	@ 32¢

Allowance Per Week

¼ lb. macaroni	@ 6¢	1/32 lb. mustard	@ 48¢
¼ lb. cheese	@ 16¢	1/128 lb. spices	@ 16¢
¼ lb. tomatoes	@ 20¢	1/16 gal. vinegar	@ 16¢
¼ lb. salt	@ 1¢	1/32 gal. pickles	@ 16¢
1/32 lb. pepper	@ 16¢	1/32 gal. molasses	@ 24¢

114 (Views 266, 585) A regiment of infantry is composed of 56 officers and 1361 men in time of peace. A brigade consisting of three regiments is composed of 172 officers and 4098 men. (a) How many officers and men additional to those in the separate regiments are added to form the brigade? (b) How many extra men are added to a brigade to bring it up to the war strength of 172 officers and 6021 men?

Foreign Views

The matter of standard time should be discussed in connection with view 353, The regulator of the world's clocks. View 357 gives an opportunity to give a problem based on the average yield of 32.5 bushels to the acre in England and only 15.2 bushels in the United States.

The cattle views (views 358, 364, 370, etc.) might be accompanied by production problems based on this country's figures, especially in a class that has not already had applications of this character.

The same procedure may be followed with such views as show processes: plowing (view 561), threshing (view 562), weaving (view 563), harrowing (view 549).

City views may form the basis of problems concerning distance, travel, cost of cable dispatches, standard time, foreign money, etc.

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Some of the foreign views might be used as the basis for problems in duties.

115 (View 437) (a) Find the duty on 100 cases of Valencia oranges weighing 160 pounds each at ½¢ per pound. (b) The foreign cost was 13 pesetas (a peseta is 19.3¢) per each case. How much is that in U. S. money? (c) The freight was 70¢ per case. Find the total cost, including duty. (d) What is the weight of an orange in ounces when there are 640 to a case?

116 (View 531) Find the duty on 10 cases, each containing 120 boxes of sardines when the duty is 25% of the foreign cost of 1 franc (19.3¢) per box.

Problems Without Figures

A useful type of problem is one in which the pupils supply the figures.

117 (View 33) Enumerate the articles required to furnish these rooms. Give the estimated cost of each and the total.

118 (View 254) (a) How many miles could the *Oregon* have saved in a trip from San Francisco to Santiago if the Panama Canal had been completed? (b) How much time?

Pupils should be asked to make problems in connection with the auction sale (view 582), hides (view 272), a bank (view 590), etc.

Figures Without Problems

Pupils might be asked to suggest problems in connection with view 305, for instance; using the figures 1⅛ miles, 641 houses, $8,000,000.

Among those that might occur to the pupils might be the standard time of Rio de Janeiro, the average cost of the destroyed houses, the area covered by the street, the cost of paving, the number of blocks, the average width of a plot, etc., etc.

Quantities and Values

In these days of fluctuating prices, many of those given in the textbook examples are greatly at variance with those prevalent in the vicinity of the school. Although answering most purposes for which problems are given, they sometimes fail to satisfy the pupils unless it is stated that these conditions represent a transaction that took place some time ago, and as a second problem pupils might be asked to obtain the result at existing prices, and to find the per cent of increase and decrease.

Pupils should remember, however, that a great variety of conditions exists in a country as large as ours and that they should not assume that no data are correct that differ from those of the vicinity.

Dramatized Problems

In many progressive schools certain Arithmetic problems, such as the forming of corporations, are dramatized by the class with marked success. *Step 1.* Two pupils retire from the room, then enter and meet apparently unexpectedly. They carry on an animated conversa-

tion, being careful of their English and manners. Number 1 is a local business man, number 2 a banker friend of his who has just returned from a trip abroad, unexpectedly as he says, because he found a large tea and rice plantation in the famous Shizuoka District of Japan, on which he has an option for six months, which offers great possibilities for money making. Number 1 is eager to know about the proposition, but when he learns that it will take $200,000 to buy the 4000 acres of land (500 of which is suitable for rice and 3500 for tea) he suggests that they call in other friends who will be able to help them form a $1,000,000 corporation and then the company thus formed will raise and market tea and rice on a large scale. They both agree to this plan and retire from the room.

Step 2. Ten to twenty other members of the class (or the entire class if not too large) retire with these two and re-enter together with them. Then they are introduced to number 2 by number 1. They all represent wealthy men in different businesses. Number 3 is a broker and will understand how to market the bonds of the company. Number 4 is a transportation man, president of a big railroad. He will understand what transportation facilities will be needed in marketing their crop. Number 5 is the president of a big steamship corporation and will know what the necessary shipping should cost. Number 6 is an insurance broker and will tell them the cost of insuring their ships and cargoes. Number 7 is a wealthy banker. Number 8 is a big merchant. Number 9 is another merchant, etc. After all have been introduced, and seated around a table, number 1 explains the proposition as number 2 did to him, only he goes more into detail and shows a stereograph (number 530) of the tea and rice fields on which number 2 has the option. He also shows stereographs 527, 528, 529, 549, 550, other views of rice fields; a large transport ship (view 280) which can be bought for $160,000; the Pacific entrance of the Panama Canal (view 256); the Gatun Locks (view 253); and the Atlantic exit (view 252) which they will use in reaching New York, together with views 25 and 26 of New York City where their general offices and salesrooms will be located.

Step 3. They form a company with $1,000,000 of paid up capital distributed among the class members as stockholders, hold a stockholders' meeting and elect a board of seven directors who in turn elect President, Vice-President, Secretary, Treasurer, General Manager, etc.

Very many interesting problems will suggest themselves to the teacher's mind in connection with the forming of such a corporation, such as the figuring of the first cost of a pound of tea and a pound of rice in Japan, the transportation and insurance cost of each, the selling cost of each and the amount of profit that would be left the firm if the products were sold at the regular market price.

Tea and rice were used in the above problem but views of any other industry could have been used equally as well. The following views lend themselves readily to similar dramatizations:

(a) Western wheat ranch 178, 179, 199, 177, 233, 218; Grain carriers 154; Grain elevators 174, 48.

(b) Corn farm 180, 184, 136, 137, 160, 165.
(c) Western stock ranch 127, 186, 188, 185, 140.
(d) Automobile manufacture 150, 151, 152; Rubber tires 132, 131, 247.
(e) Iron mine 163, 164, 154, 128, 62, 63, 64.
(f) Cotton plantation 117, 124, 125, 119; Cotton manufacture 286, 14, 15, 16.
(g) Timber land 221, 224, 215, 216, 217.
(h) Silk manufacture, U. S., 22, 23, 24, 53, 54, 55; Silk culture, Japan, 536 to 541.
(i) California fruit ranch, oranges 237, 238; Grapes 236.
(j) Banana plantation 294.
(k) Florida pineapple plantation 108.
(l) Coffee plantation 302, 310, 311, 295.
(m) Idaho sheep range 190, 145, 17, 18.
(n) Copper mine 187, 155, 156, 157.
(o) Coal mine 74, 75, 76, 77, 78, 79.
(p) Oil lease 122, 69, 70, 123.

Many other problems can be dramatized in different ways. No two problems in life present themselves with the same conditions or can be solved in the same manner. In choosing the setting for each dramatization the children are being given versatility in studying and solving the problems and staging the real dramas of every day life.

FOR THE LITTLE FOLKS

By WILLIAM C. BAGLEY, Ph.D.

DEAN SCHOOL OF EDUCATION, UNIVERSITY OF ILLINOIS, URBANA, ILL.

Concreteness is essential at all stages of the educative process, but it is especially important in the early grades of the elementary school. Here the emphasis in all subjects of instruction must be upon the formation of clear, definite, and typical images as a basis for the more abstract concepts. These images should be based upon experiences — actually undergone or vividly imagined — in a large number of situations typifying the most important phases of human life and the most significant natural phenomena which surround and condition human life. It is through insuring the effectiveness of the imagined experiences that the stereograph can be most profitably used in these lower grades. Even though the child's immediate environment may be narrowly circumscribed he may look through the stereoscope into a larger world, and a few well directed questions by the teacher will enable him to imagine how it would feel to be in this world, and how he would act if he were actually there. *It is this actual translation of one's self into the pictured situation that conditions the effective educational use of the stereoscopic views.* If it is a mountain that is pictured, the child should imagine how it would feel to climb the mountain, clambering over the rocks, watching to avoid the crevices, and slowly toiling toward the summit. If he vividly images these conditions, he will have a basis for understanding later why mountain ranges are barriers to communication and travel, and the significance of human ingenuity in constructing railroads over mountain passes and in piercing the ranges with tunnels.

Or it may be a series of pictures that follow through the various stages of the lumber industry; he, too, must work

17 cents per hour for time spent in the classroom.

No text-books are used, the teacher depending upon the and the lantern to supply matter for her oral instruction in history, patriotism, and citizenship, together with the evolu material on which the pupils are working, tracing the cotto plantation (view 117), to the gin (view 125), to the wharves the carding room (view 286), etc., etc., until it finally reacl tory machines in its finished form.

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(b) The average per week for 35 weeks.
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85 The expense of keeping this cow included 3.5 tons of hay at $7 per ton, 1200 pounds of ground feed at 90¢ per 100 pounds, and pasture worth $8. (a) Find the total expense. (b) How much less is this than the sum received for the milk?

86 An Ayrshire cow (view 371) gives 9000 pounds of milk in a year, from which are produced butter (view 45) amounting to 5% of this weight, skim milk amounting to 80%, and buttermilk amounting to 15%. Find the value (a) of the butter at 32¢ per pound. (b) Of the skim milk at 16¢ per 100 pounds. (c) Of the buttermilk at 12¢ per 100 pounds.

87 From the farm to the table the following successive losses occur in the weight of a cow weighing 1000 pounds on leaving the ranch (view 127):
5% during transportation to the stockyards (view 140) (a)
42% of the remainder in killing and dressing (view 141) (b)
10% of the remainder in cooking (c)
25% of the remainder in bones and in fat not eaten (d)
Find the successive remainders (a), (b), (c), and (d).

88 (Views 172, 142) (a) Find the weight of a 200-lb. hog after it loses 20% in dressing. The hams (view 143) weigh 12½% of the dressed weight. (b) Find the weight of a ham. The lard constitutes 20%. (c) Find its weight. The shoulders and the sides of bacon weigh the same as the hams. (d) Find the weight of the remainder: head, feet trimmings, loins, etc.

Some Transportation Problems

89 (View 518) A bushel of salt (1¼ cu. ft.) weighs 55 pounds. Find the weight of a wheelbarrow load of 2¾ cu. ft.

90 (View 138) A team of horses weighing 3000 pounds can pull a 1000-lb. wagon and a 2000-lb. load on a dirt road. How many pounds should a Percheron team, weighing 4000 pounds, draw in the same wagon on the same road?

91 On a smooth pavement a 3000-lb. team can draw a total weight of 5000 pounds including wagon and load. What should the Percheron team draw on the same road in the same wagon?

92 A finished road consists of 3 inches of fine broken stone (view 3) laid on 12 inches of coarser material. If the roller (view 516) compresses it into ¾ of the space it occupies when loose, how many inches of each material must be used?

(300 lb.) 3 miles to a railroad station at the r
ton per mile? (b) What is saved in the transpc
bales when the improvement of the road reduc
12¢ per ton per mile? (View 124.)

Miscellaneous and Supplementary Problen

96 (View 183) Find in the table below the cost of eac
(a, b, c, d) fed to 2 Poland China pigs by the girl
club prize; also (e) and (f):
(a) 420 lb. ear corn at 60¢ per bushel of 70 lb.
(b) 200 lb. middlings at $1.50 per 100 lb.
(c) 1680 lb. skim milk at 25¢ per 100 lb.
(d) Pasture for 83 days at 15¢ per month.
(e) Gain per day at 332 lb. for 83 days.
(f) Cost per 100 pounds of gain.

97 (View 172) The pig of a boy member of the sa
sumed the following in 72 days. Find the cost of
(a) 224 lb. ground corn at 60¢ per bushel of 5(
(b) 90 lb. of ground wheat (inferior) at 80¢
60 lb.
(c) 600 lb. skim milk at 25¢ per 100 lb.
(d) Pasture for ⅛ year at $3.60 per year.
Find (e) the daily gain, if the total increase in we
(f) The cost per 100 pounds of increase.

98 (Views 150, 151) Find the expense of a 3-ton tru
of 300 working days, averaging 50 miles of actua
day.
(a) Depreciation, 15% of $2800, its cost.
(b) Interest, 5% of cost.
(c) Labor, 300 days at $3.
(d) Tires, $400; overhauling, $200; current re
(e) Cost of gasoline at 25¢ per gallon, ass

his road. (a) What is his yearly saving? (b) What interest is this on his increased yearly tax of $25 levied to pay for the improvement?

101 (Views 310, 311) A dealer bought 1000 bags of coffee, weighing 130 pounds each, at 12.42¢ per pound and paid 4¢ brokerage per bag. (a) Find the cost of the coffee. (b) The cost of roasting at 1½¢ per pound. (c) The total cost. (d) The weight after roasting if the coffee loses 15% of the original weight. The roasted coffee is packed into bags holding 100 pounds each. (e) How many bags are needed? (f) Find the cost of the bags at 18¢ each. (g) How much more is this than the price received for the original bags, 8¢ each?

102 (Views 115, 325) A fertilizer contains 10 parts of nitrate of soda, 17 of kainit, and 53 of phosphate. How many pounds of each are there in a ton?

103 (View 83) Find (a) the profit made on a tenth of an acre of tomatoes, when the land rent is $1, labor $3, staking and pruning $2, fertilizing $2.50, cans $36, canner $5, cost of canning $10, and the output 1200 cans at 8¢ per can. (b) Find the per cent of profit.

104 (View 44) Spraying materials usually cost as follows: Lime 1 cent per pound; copper sulphate 10 cents per pound; Paris green 30 cents per pound; arsenate of lead 15 cents per pound; kerosene 13 cents a gallon; hard soap 10 cents per pound; lime-sulphur mixture 15 cents per gallon.

(a) Find the cost of the following formula:
5 pounds of lime
3 pounds of copper sulphate
50 gallons of water

(b) Find the cost of the following formula:
2 gallons of kerosene
1 pound of hard soap
1 gallon of water

(c) Find the cost of the following formula:
3 pounds of arsenate of lead
50 gallons of water

105 (Views 47, 166) If it takes three applications of 2 pounds of arsenate of lead and three days' time at $1.25 per day, to destroy the Colorado beetles on an acre of potatoes, how many bushels of potatoes at 50¢ per bu. will be required to pay for the treatments?

106 (View 117) A farmer plants an acre to cotton three years in succession, using 400 pounds of fertilizer each year (views 115, 325). The first year the acre produces a bale, the second year five-sixths of a bale, and the third year two-thirds of a bale. What is the income for the three years if cotton sells at 12¢ per pound and seed at $20 a ton? (A bale of lint weighs 500 pounds; the seed of a bale 1000 pounds.)

per foot; 4-inch 4¢ per foot; 5-inch 5¢ per foot; per foot. Find the cost of 500 feet of each.

109 A man owns a plat of swamp land 48 rods longs an

(a) Find its area in acres.

(b) There is a small stream running through the plat lengthwise. To drain the plat i it requires 4-inch tiling laid 3 feet deep Find the cost of tiling to drain the plat.

(c) It costs 12½¢ a rod to dig the ditches. ditching cost?

(d) What will the system of drainage cost in

(e) The plat has been producing 2 tons of ha valued at $10 per ton. How many bu (view 184) per acre will the plat now ha the first year to pay for the drainage syst a return equivalent to the usual income crop?

Governmental Problems

In connection with such views as 32 Immigrants lan saving corps; 242 Submarine and torpedo boats; 254 Batt ama Canal; 266 Military parade, Quebec; 385 Cuirassier lin; 426 French troops; 476 Grecian soldiers; 585 Revi and with many others showing governmental buildings, volving taxes, duties, postage, etc., might be employed, th realizing the Government's need of money.

110 The following shows the items of one type of a s ration, with the cost of each to the government one of its posts. (a to q) Find the cost of each the results in cents to four decimal places. (r) of the entire ration. (s) Its total weight, taking

(h) 3.2 oz. sugar at 4.165¢ per pound.
(i) .5 oz. evaporated milk at 6.67¢ per 8-oz. can.
(j) .02 pt. vinegar at 14.9¢ per gallon.
(k) .64 oz. salt at .65¢ per pound.
(l) .04 oz. pepper at 4.42¢ per ¼-lb. tin.
(m) .014 oz. cinnamon at 15¢ per ¼-lb. tin.
(n) .64 oz. lard at 12.98¢ per pound.
(o) .5 oz. butter at 31.8¢ per pound.
(p) .04 pt. sirup at 25¢ per gallon.
(q) .014 oz. lemon extract at 30¢ per 8-oz. bottle.

111 Find the cost of rations for 1000 soldiers for 30 days.

112 Find the cost of rations for 1,000,000 soldiers (a) for one day, (b) for 365 days.

113 (View 100) Find the weekly cost of the following items of a United States Navy ration:

Allowance Per Day

1¾ lb. meat	@	12¢	⅛ lb. coffee	@	16¢
1¾ lb. potatoes	@	1½¢	1/16 qt. milk	@	8¢
1¼ lb. bread	@	4¢	¼ lb. sugar	@	6¢
9/16 lb. apples	@	2¢	⅛ lb. butter	@	32¢

Allowance Per Week

¼ lb. macaroni	@	6¢	1/32 lb. mustard	@	48¢
¼ lb. cheese	@	16¢	1/128 lb. spices	@	16¢
¼ lb. tomatoes	@	20¢	1/16 gal. vinegar	@	16¢
¼ lb. salt	@	1¢	1/32 gal. pickles	@	16¢
1/32 lb. pepper	@	16¢	1/32 gal. molasses	@	24¢

114 (Views 266, 585) A regiment of infantry is composed of 56 officers and 1361 men in time of peace. A brigade consisting of three regiments is composed of 172 officers and 4098 men. (a) How many officers and men additional to those in the separate regiments are added to form the brigade? (b) How many extra men are added to a brigade to bring it up to the war strength of 172 officers and 6021 men?

Foreign Views

The matter of standard time should be discussed in connection with view 353, The regulator of the world's clocks. View 357 gives an opportunity to give a problem based on the average yield of 32.5 bushels to the acre in England and only 15.2 bushels in the United States.

The cattle views (views 358, 364, 370, etc.) might be accompanied by production problems based on this country's figures, especially in a class that has not already had applications of this character.

The same procedure may be followed with such views as show processes: plowing (view 561), threshing (view 562), weaving (view 563), harrowing (view 549).

City views may form the basis of problems concerning distance, travel, cost of cable dispatches, standard time, foreign money, etc.

(View 331) Find the duty on 10 cases, each cont
of sardines when the duty is 25% of the foreign
(19.3¢) per box.

Problems Without Figures

A useful type of problem is one in which the pupils su

117 (View 33) Enumerate the articles required to
rooms. Give the estimated cost of each and the

118 (View 254) (a) How many miles could the *Ore*
in a trip from San Francisco to Santiago if the
had been completed? (b) How much time?

Pupils should be asked to make problems in connec
auction sale (view 582), hides (view 272), a bank (view

Figures Without Problems

Pupils might be asked to suggest problems in connect
305, for instance; using the figures 1⅛ miles, 641 houses,
Among those that might occur to the pupils might be
time of Rio de Janeiro, the average cost of the destroy
area covered by the street, the cost of paving, the numl
the average width of a plot, etc., etc.

Quantities and Values

In these days of fluctuating prices, many of those give
book examples are greatly at variance with those pre
vicinity of the school. Although answering most purpo
problems are given, they sometimes fail to satisfy the p
is stated that these conditions represent a transaction th
some time ago, and as a second problem pupils might be
tain the result at existing prices, and to find the per ce
and decrease.

tion, being careful of their English and manners. Number 1 is a local business man, number 2 a banker friend of his who has just returned from a trip abroad, unexpectedly as he says, because he found a large tea and rice plantation in the famous Shizuoka District of Japan, on which he has an option for six months, which offers great possibilities for money making. Number 1 is eager to know about the proposition, but when he learns that it will take $200,000 to buy the 4000 acres of land (500 of which is suitable for rice and 3500 for tea) he suggests that they call in other friends who will be able to help them form a $1,000,000 corporation and then the company thus formed will raise and market tea and rice on a large scale. They both agree to this plan and retire from the room.

Step 2. Ten to twenty other members of the class (or the entire class if not too large) retire with these two and re-enter together with them. Then they are introduced to number 2 by number 1. They all represent wealthy men in different businesses. Number 3 is a broker and will understand how to market the bonds of the company. Number 4 is a transportation man, president of a big railroad. He will understand what transportation facilities will be needed in marketing their crop. Number 5 is the president of a big steamship corporation and will know what the necessary shipping should cost. Number 6 is an insurance broker and will tell them the cost of insuring their ships and cargoes. Number 7 is a wealthy banker. Number 8 is a big merchant. Number 9 is another merchant, etc. After all have been introduced, and seated around a table, number 1 explains the proposition as number 2 did to him, only he goes more into detail and shows a stereograph (number 530) of the tea and rice fields on which number 2 has the option. He also shows stereographs 527, 528, 529, 549, 550, other views of rice fields; a large transport ship (view 280) which can be bought for $160,000; the Pacific entrance of the Panama Canal (view 256); the Gatun Locks (view 253); and the Atlantic exit (view 252) which they will use in reaching New York, together with views 25 and 26 of New York City where their general offices and salesrooms will be located.

Step 3. They form a company with $1,000,000 of paid up capital distributed among the class members as stockholders, hold a stockholders' meeting and elect a board of seven directors who in turn elect President, Vice-President, Secretary, Treasurer, General Manager, etc.

Very many interesting problems will suggest themselves to the teacher's mind in connection with the forming of such a corporation, such as the figuring of the first cost of a pound of tea and a pound of rice in Japan, the transportation and insurance cost of each, the selling cost of each and the amount of profit that would be left the firm if the products were sold at the regular market price.

Tea and rice were used in the above problem but views of any other industry could have been used equally as well. The following views lend themselves readily to similar dramatizations:

(a) Western wheat ranch 178, 179, 199, 177, 233, 218; Grain carriers 154; Grain elevators 174, 48.

(b) Corn farm 180, 184, 136, 137, 160, 165.
(c) Western stock ranch 127, 186, 188, 185, 140.
(d) Automobile manufacture 150, 151, 152; Rubber tires 132, 131, 247.
(e) Iron mine 163, 164, 154, 128, 62, 63, 64.
(f) Cotton plantation 117, 124, 125, 119; Cotton manufacture 286, 14, 15, 16.
(g) Timber land 221, 224, 215, 216, 217.
(h) Silk manufacture, U. S., 22, 23, 24, 53, 54, 55; Silk culture, Japan, 536 to 541.
(i) California fruit ranch, oranges 237, 238; Grapes 236.
(j) Banana plantation 294.
(k) Florida pineapple plantation 108.
(l) Coffee plantation 302, 310, 311, 295.
(m) Idaho sheep range 190, 145, 17, 18.
(n) Copper mine 187, 155, 156, 157.
(o) Coal mine 74, 75, 76, 77, 78, 79.
(p) Oil lease 122, 69, 70, 123.

Many other problems can be dramatized in different ways. No two problems in life present themselves with the same conditions or can be solved in the same manner. In choosing the setting for each dramatization the children are being given versatility in studying and solving the problems and staging the real dramas of every day life.

FOR THE LITTLE FOLKS

By WILLIAM C. BAGLEY, Ph.D.

DEAN SCHOOL OF EDUCATION, UNIVERSITY OF ILLINOIS, URBANA, ILL.

Concreteness is essential at all stages of the educative process, but it is especially important in the early grades of the elementary school. Here the emphasis in all subjects of instruction must be upon the formation of clear, definite, and typical images as a basis for the more abstract concepts. These images should be based upon experiences — actually undergone or vividly imagined — in a large number of situations typifying the most important phases of human life and the most significant natural phenomena which surround and condition human life. It is through insuring the effectiveness of the imagined experiences that the stereograph can be most profitably used in these lower grades. Even though the child's immediate environment may be narrowly circumscribed he may look through the stereoscope into a larger world, and a few well directed questions by the teacher will enable him to imagine how it would feel to be in this world, and how he would act if he were actually there. *It is this actual translation of one's self into the pictured situation that conditions the effective educational use of the stereoscopic views.* If it is a mountain that is pictured, the child should imagine how it would feel to climb the mountain, clambering over the rocks, watching to avoid the crevices, and slowly toiling toward the summit. If he vividly images these conditions, he will have a basis for understanding later why mountain ranges are barriers to communication and travel, and the significance of human ingenuity in constructing railroads over mountain passes and in piercing the ranges with tunnels.

Or it may be a series of pictures that follow through the various stages of the lumber industry; he, too, must work

with the woodmen felling the trees; help them to saw the trunks into logs, load them on the sledges, and haul them to the river; follow the "drive" down the rapid stream to the mill, balancing himself with the other drivers on the rolling logs; watch the great saws as they slice the logs into lumber, and then help load the boards upon the tram cars to be carried to the drying piles in the yard.

The imagination of little children is naturally most readily caught and stimulated by pictures dealing with the life and activities of children themselves. A most effective introduction to the study of other countries, then, is through the child-life and the home-life of these countries. Again the problem is to get the child to put himself into the picture — to imagine himself playing or working with the other children and learning in this way fundamental facts about the region that is being studied, its climate and surface-features, its productions, occupations, and industries, and the social customs of the people. In View No. 292, for example, a primitive Central American home is pictured. If a child actually reads himself into this situation and imagines himself aiding in the work that the members of the family are doing, he will gain a vivid idea of the conditions of life in this region and of the many ways in which these differ from the conditions under which he lives. But there are certain resemblances, too; food must be provided for the family and prepared for eating; there must be utensils for preparing the food and for keeping the home in a condition of reasonable comfort; and the children, even in Central America, must help with the home work. It is through these points of similarity that the differences can be made clear and interesting and may come to form the basis of an understanding of the characteristic features of the region that is being studied and of its life and customs.

This is only suggestive of what the stereograph may be made to do in stimulating the imagination and thus impelling the child to undergo the significant experiences which in their totality may well give him the essential basis of a clear conception of the world in which he lives. And this kind of instruction may be carried on systematically (but with constant regard for the importance of concreteness and vividness) during the first four years of school life.

45. CHILDREN OF THE WORLD

By G. A. MIRICK, A.M.

EDUCATIONAL SPECIALIST, CAMBRIDGE, MASS. FORMERLY ASSISTANT COMMISSIONER OF EDUCATION, SUPERVISING ELEMENTARY SCHOOLS, STATE OF NEW JERSEY

Children are interested in children, but not very much in descriptions of them or in scientifically classified facts about them. They like to see children in action, doing the things that children naturally do. They also enjoy seeing grown people engaged in the common affairs of life.

A skillful story teller can paint word-pictures that children appreciate, but the photograph is superior to most word-pictures, and the stereograph is the most lifelike of all photographs for it is the only three dimension picture and seen through a stereoscope, each figure in a stereograph stands out in bold relief and exact size in relation to the other objects in the scene. The stereograph teaches concentration, it can be studied in detail and it gives the impression of solidity and of space, so that for young children, possibly for them even more than for adults, the stereograph has a value and an attractiveness all its own.

After the pictures are thoughtfully selected from the point of view of the interests and mental capacities of the children who are to use them, a few only should be used in one lesson. As a rule, one is more useful than a larger number. If several pictures illustrating one topic are available, it will generally be more profitable to study two or three in successive lessons rather than to give a hasty, ill-considered glance at all, for *it is the study of a picture that makes its use educational,* not the mere looking at it.

The stereographs for this classification have been selected because of the clearness with which they picture their story; but yet each picture illustrates a variety of topics. For example, in stereograph 550, there is the home with its side of bamboo poles and its thatched roof of dried grasses; or one may study the girls, their color, features, hair, clothing; or

one may approach the picture with an interest in what the people are doing and the implements they are using. While a teacher may properly allow pupils to study a given picture for all of these things, yet, in general, it will be found more profitable to consider one element of a picture at a time, using several pictures that portray the same kind of facts. Each of these pictures may then be restudied in other lessons to learn other sets of facts that they illustrate. It requires some skill on the part of the teacher to keep the minds of "little folks" centered on one point of interest, but in proportion as she is successful in doing this, she will find her picture lesson educationally profitable to them.

The stereographs that are here suggested for use in kindergarten and primary grades are grouped by countries first. This is the *First Series of Studies.* This grouping shows, at a glance, the available material for illustrating any course of study that a teacher may be following. The analysis of each picture indicates, like a table of contents, what it teaches.

But, because many schools follow a course of study in these lowest grades that is based on the family, school and community life, a second grouping is made by topics. This is the *Second Series of Studies.* No attempt is made to give a complete list of the topics that may be illustrated by the stereographs, but enough are given to show clearly their varied usefulness in this kind of study.

A third grouping has been made from the point of view of *primitive life.* This is the *Third Series of Studies.*

FIRST SERIES OF STUDIES

Stereographs and lantern slides grouped by countries.

Throughout each of the three series of studies, there will be found under the various topical headings a considerable range of scenes showing children — at work, at school, at play. Likewise there is a good representation of the homes and home life in the various lands.

UNITED STATES

Children at Play

72 Children in a field of daisies. Relates to games, clean and happy faces, tidy clothes, nature study.

60 Children at play by the seashore. Relates to summer sports, bathing, seabeach.

School Garden

83 Children at work in a school garden. Relates to nature study, gardening, useful work children may do.

Fruits

175 In an apple orchard. Picking, sorting, and putting into barrels.
236 Picking grapes in California. Vineyard; farmer's home and windmill.
85 In a peach orchard. Picking peaches.
47 In a field of cantaloupes. Vines and fruit; picking and loading into a wagon.
108 In a field of pineapples. Growing pineapples; white and colored men picking them; windmill pumping water into a water tank for irrigation. Note the thick gloves worn by the men.

Vegetables

137 In a field of pumpkins. Related to fall of the year. Pumpkins growing in a field of corn. Corn stacked to dry and harden. For field of corn, see 184.
166 Digging potatoes. A large field in Minnesota. Digging by machinery. Gathering into baskets.
149 Celery. Blanching and harvesting; team of horses; dog; rich moist soil.

Grain

184 Kansas cornfield. Stone wall; corn stalks two and three times as tall as a man; corn flowers. For corn stacked in a field, see 137.
199, 218, 177 Wheat.
147 Oats. Hauling from shocks; team; wagon; home in distance.
105 Rice. Negroes hoeing rice grown under irrigation.

Nuts

118 A crop of peanuts. Peanuts grow on the roots of vines as potatoes do. The picture shows in the background the vines stacked around a pole to dry. The pole is to keep the stack from falling over. In the middle ground are colored men and women picking the nuts from the vines and into barrels to ship away. The white woman is evidently selling her crop to the man in front of her. Peanuts grow in the southern part of the country.
234 A shower of almonds. An almond orchard in California. Men shaking the nuts onto a sheet.

117 Colored children picking cotton. A field of cotton; a basket of picked cotton. Note that the cotton is tall as the larger girl in the foreground. Compa the pupils know.

Animals

190 Sheep in a pasture. An Idaho range. Shepherd an
173 A flock of sheep in the fall of the year. Heavy sheep. Trees without leaves.
172, 183, 122 Hogs feeding. A Kansas pasture.
186, 127 Cattle at pasture. A western range. Th "rounding up" a herd; a lasso; calf in foregroun
188, 138, 71 Horses.
57 Milking cows. Fine modern dairy barn.
56 In a hen-house. A beautiful flock of white hens. S ter on floor; roosts on the left. The open box on picture is a nest.
239 Baby ostriches. Also ostrich eggs and grown ostrich
216 Geese. For meat and feathers. At large lumber mi
246 Dog team in Alaska. Miners within Arctic circle.

Fish

13 Drying codfish in the sun. A fishing boat in the ground. The fish after being caught in the ocean to shore, their heads cut off, they are split open, sp salt and put on racks in the sun to dry. Pupils fish and haddock in the fish markets. Dry fish no erally is sold in shredded form or cut into pieces in pound boxes.
226 Catching salmon in nets.
244 Indians drying salmon.

OUR BROTHERS AND SISTERS IN POSSESSION OF UNITED STATES

260 Learning to be Americans. A schoolhouse and children in Hawaii; the American flag.

244 In cold Alaska. Drying fish.

249 At the Panama Canal. A village scene.

551 Our Philippine brothers. A coconut grove. The palm leaves and coconuts on the trees; piles of coconuts; taking off the husks, cutting open the nuts. Clothing of the native men and boys.

550 Our Philippine sisters. Bamboo hut with thatched roof of dry grasses. Native girls in native dress pounding rice.

548 Riding on oxen. Philippine natives on way to market. Note the baskets, the harness, the barefoot man and woman, the clothing for a hot country and the American umbrella. Note also the shadow cast by the oxen, which shows that it is about noon.

AMERICAN COUSINS TO THE SOUTH OF US

Mexico

290 Little cousins in gala dress. Children's costumes; odd hats of the men.

281 Poor little Mexican. Little boy behind the cactus plant; untidy surroundings; plants growing on the roof of the hut.

Central America

292 Learning to make corn cakes. A family scene. The mother is rolling the corn; the older daughter is forming the dough into a cake; the small daughter is watching. Note the jar of water, the little stone table and roller and the odd-looking broom.

294 In a banana grove. Bunches of bananas have been loaded on a mule. A man in the left foreground is taking down a bunch from the tree. In the midde ground, a bunch can be seen hanging high in the tree. Note the beautiful vista between the trees, the large leaves and the bananas growing upside down.

298 A tropical farmyard. A thatched-roof cottage with the family gathered about the door. Note the palm trees, a sign of a hot country.

South America

306 South American cousins. School children, Brazil. Note their likeness in dress and general appearance to American school children.

336 A city cousin. Playing on a balcony.

324 Home from the store with mother. The little boy is carrying his mother's bundle. Politeness is the same all over the world.

339 Fresh milk. A little boy is buying some milk for the family.

The cow is brought to the door. Note the narrow street and sidewalks.

338 The pet rooster. Looking down on a city of Venezuela. Note the baby without any clothes. This is a sign of a hot climate. Note also the tiny backyard in the foreground. This is a crowded tenement district.

341 The baker. Note the height of the donkey compared with the height of the man. Then note the big barrels in which the bread is carried.

328 Our cousins in furs and blankets. Note the different signs that the climate is cold — the furs, the blankets held tightly around the neck and body, the babies tucked down inside the fur wraps on the backs of their mothers.

EUROPE

British Isles

347 Landing in England. Steamboats and wharf, Liverpool.

378 Irish coal. Donkey carts loaded with peat.

373 A home in Scotland. Summer time: afternoon tea: boy in middle ground. Note the vine growing up over the cottage roof; the thatched roof; the grasses that are growing from the turf on the roof of the ell in the left foreground. Compare with 281.

Northern Europe

411 Milking time in Norway. A farmyard scene.

409 Carding and spinning wool in Norway. A basket of wool; a woman combing it to straighten the fibers; a woman spinning; a spinning wheel and balls of spun wool. Note the women's costumes and the farm houses in the background.

410 Making bread in Norway. An out-of-door kitchen.

413 Milking time in Lapland. A herd of reindeer. Note their height compared with the man. Compare with animals the children know. Note also the pasture fence, and the child and dog in the foreground.

481 Selling fish in Finland. Women are both selling and buying. See back of stereograph.

396 Selling milk in Belgium. Dog cart, milk cans, peasant's dress.

402 Dutch children. Costumes, wooden shoes.

403 Milking time in Holland. Note the rope around the cows' hind legs to keep them from walking away; wooden shoes of men. Windmills in background.

399 Dutch canal and windmill. Windmill works a large pump that pumps the water from the low land into the canal.

Central Europe

423 Flower market in Paris.

431 Washday in France. Bringing bundles of clothes on head to wash; scrubbing; piles of wet clothes; drying them. Tell the

story of the dangers of floods related on back of the stereograph.

390 Harvest time in a vineyard — Germany. Baskets of grapes; height of vines; long straight rows.

393 Market day in Germany.

388 Making hay in Germany. Note the pitch fork in the left foreground.

465 School children — Poland.

487 Russian girls selling milk. Milk carried in jars. Note caps, collars, ornamented skirts.

485 Market day in Poland. Hebrew quarter.

469 Market day in Bulgaria. A pile of onions, of potatoes, and of cabbages can be distinguished.

471 Roumanian mother and children. Native costumes.

488 Farmer boy in Russia. Hunting for worms. The boy in dress looks like an American farmer boy. The man's dress and his plow are distinctively Russian.

447 Market day in Switzerland. Little country girl with basket and her goats; small garden on right (cf. 445); store on left; and tent-like booth in middle ground. Note wide overhanging roof and snow capped mountains.

445 Home scene in Switzerland. Cottage; winter's fire wood piled against the house; sled runners suggesting the long winters; rocks on the roof of the little shed to keep it from blowing away; the little garden fenced in to keep out the cows, goats and sheep that come down from the mountain pasture at night. Winter all the time on the top of the mountain in background.

Southern Europe

479 Harvest time in Greece. Mules treading on the grain to shake the seeds from the stalks. Note the costumes and the pitch fork.

455 Neighbors in Sicily. Note how the clothes are put out to dry. This is the customary way in crowded tenement districts all over the world.

437 Helping in an orange grove — Spain.

438 Barrels of grapes from the vineyards, Spain. Children have seen the little barrels of white grapes packed in sawdust in fruit and grocery stores. The picture shows these barrels piled on two-wheeled carts. They are going from the vineyards to the wharf where the grapes will be shipped for foreign countries, perhaps to America.

ASIA

Japan

533 Bed time. See back of stereograph for description.

534 Babies and flowers. See back of stereograph.

542 Jars for sale. Note size and shape of jars and pro
the "saddle" on which they are carried; the pe
two kinds of Korean hats.

543 Charcoal peddlers.

China

520 School children. Costumes and cues; American teac
ground.

522 Farmer boys. Note height of donkey compared wi
compare with reindeer 413; rude harness of ropes

546 House boats. Bamboo roofs in sections; several se
on one side; platforms on side. The roofs are
playgrounds of the children.

India

510 Girls on a picnic. Note the ox yoke; the rope
driver; the cart top of matting.

505 An elephant ride. Ornamented tusks and harness
ings; native costumes, especially turbans.

509 Elephants at work. The harness and saddle; the dr
goad.

506 Making shawls. Spinning wool (cf. Norwegian me
loom with weavers; natives, costumes, turbans.

503 Going to church. Mosque (church); native, costum

507 A queer kind of boat — inflated skins.

Palestine

498 Grinding wheat. See back of stereograph.

AFRICA

Egypt

562 A farmer boy in Egypt. Oxen drawing a drag o

Children at Home

6 Tenement, Boston; 122 Texas oil field; 158, 204, 263, 328 Indian children; 236 California vineyard; 239 On ostrich farm; 249 At Panama; 281 In an Adobe home; 292 Making Totillas; 298 On a Cuban Farm; 319 On an Argentina Vineyard; 336 Ecuador; 337 Colombia; 338, 339, 341 Venezuela; 343 Greenland; 354, 355 At English Cottages; 402 Holland, 411 Norway; 413 Lapland; 455 In Sicily; 506 Kashmir, India; 546 Philippines; 510 Burma.

Children at School

83 Children of the U. S. in a school garden.
306 School children in Rio de Janeiro, Brazil.
260 Little American citizens in Hawaii.
465 Polish school children.
520 A mission school in China.

Children at Work

83 In school garden; 117 In the cotton fields; 175 Packing apples, Mo.; 244 Alaska; 396 Milk delivery, Belgium; 437 Picking oranges, Spain; 438 Hauling Malaga grapes, Spain; 488 Russia; 522 Boys plowing, China; 551 Husking coconuts, P. I.; 552 Gathering hemp, P. I.; 562 Threshing beans, Egypt; 563 Spinning cotton, Egypt.

Children at Play

60 By the seashore; 72 Summer holiday; 290 Mexicans; 306 School children, Brazil; 336 Ecuador; 338, 339 Venezuela; 402 Dutch children; 435 Holiday in Spain; 510 A picnic party, India; 471 Roumanian children; 488 Russian boy.

Some Children in Other Scenes

32 Arriving at Ellis Island; 70 In an oil region; 61 Seeing Pittsburgh; 187 At Butte, Montana; 202 In Box Canyon; 324 Santiago, Chile; 340 Caracas, Venezuela; 367 At Stirling Castle; 347 On landing stage, Liverpool; 388 In hay fields, Germany; 392 On the banks of the Rhine, Bonn, Germany; 378 With the "peat" carts, Killarney; 381 In the streets of Belfast; 387, 393, 447 In the markets; 404 In Copenhagen; 486 In the streets of Kief, Russia; 519 Waiting for American flour in famine district, China; 535 Japanese gardens; 557 At the gates of Tunis; 564 In Egypt; 576 Seeing Victoria Falls, Africa.

Central Africa

572 Market day. Baskets, jars, bowls for carrying and holding things to sell; scanty clothing; ornaments; small quantities of things on sale. Note the porcelain washbasin in foreground and the wire fence and familiar gate in background, signs of nearness of white men.

455 Wash day in Sicily.
292 Making corn cakes in Central America.
410 Making barley bread in Norway.
498 Grinding wheat and embroidering in Palestine.
550 Preparing rice for breakfast in the Philippines.
33 A well cared for dining room.

Raising and Preparing Grain

184 Corn; 147 Oats; 549 Harrowing rice field; 528 Plantin Harvesting rice; 550 Preparing rice for breakfast; 47 out grain, Greece.

Growing Vegetables

47 Melons; 166 Potatoes; 137 Pumpkins; 562 Threshin Egypt.

Orchards and Vineyards

175 Apples; 294 Bananas; 236 Grapes, Cal.; 390 Grapes, 237, 238 Oranges, Cal.; 437 Oranges, Spain; 85 Pe Pineapples.

Harvesting Nuts

234 Almonds; 551 coconuts; 118 peanuts.

Tea, Coffee, and Chocolate

303 Chocolate or cocoa; 302 Coffee; 530 Tea.

Sugar

130 A maple grove; 198, 270, 271 Sugar beets; 333, 258 S 35 granulated sugar; 34 loaf sugar.

Fish

226 Fresh salmon; 227 Canning salmon; 13 Drying fish, Drying fish, Alaska; 531 Drying sardines, Japan.

119 Baled cotton ready to ship.
14 Spinning cotton yarn in a United States mill.
563 Spinning cotton in Egypt.

Wool

173, 190 Where wool comes from.
145 Shearing sheep.
17 Sorting wool for making different kinds of cloth.
409 Spinning wool in Norway.
506 Spinning and weaving wool in India.

Milk and Butter

159, 165 Holstein dairy cattle eating grass. Dairy barns.
57 Milking time in an American dairy.
46 Filling and capping bottles of milk.
45 1,000 lbs. freshly churned butter.
403 Milking time in Holland.
413 Milking reindeer in Lapland.
411 Milking goats in Norway.
339 Selling milk in Venezuela.
396 Selling milk in Belgium.
487 Selling milk in Russia.
160, 184 Food for the cows, corn.
181, 388 Food for cows, hay.

Beef

186 On a ranch in Kansas.
185 Fat cattle in feeding pens.
140 Cattle in Union Stock Yards, Chicago.
141 Dressed beef ready for shipment.

Pork

172, 183 Hogs in pasture.
142 Splitting carcasses in packing house, Chicago.
143 Trimming and skinning hams.
144 Making link sausages.

Useful Animals

565 Camels; 317, 403, 589 Cows; 190, 396, 246 Dogs; 522, 378 Donkeys; 401, 564 Ducks; 505, 509 Elephants; 216 Geese; 411, 447 Goats; 56 Hens; 172, 183 Hogs; 138, 147, 136, etc., Horses; 294 Mules; 239 Ostriches; 561, 298, 549 Oxen; 240 Pigeons; 190, 173 Sheep; 454 A mixed team.

Selling Produce

341 Selling bread — Venezuela; 378 Peat, Ireland; 542 Earthen jars, Korea; 543 Charcoal, Korea.

Markets

Many of the preceding lessons relate to raising food and the material of which clothes are made. Lessons based on the following will call in review previous lessons, for markets everywhere are places to which are brought the products of the soil. Such lessons should be related to a study by the pupils of the stores and markets that they visit daily.

7 A market in a great American city; 393, 387 Germany; 395 Belgium; 423 Paris; 469 Bulgaria; 481 Finland; 485 Poland; 555 Morocco; 572 Central Africa.

THIRD SERIES OF STUDIES

Stereographs and lantern slides grouped to illustrate primitive life.

PRIMITIVE LIFE

Many schools introduce children in the primary grades to the study of geography and history through the study of primitive life. There are good reasons for this plan. Primitive life is simple and easily understood. Its very crudeness appeals to children's interests, because their own play is crude. Primitive life is also picturesque and children can find many things in it that they can imitate; i.e., dramatize and fashion.

The pictures relating to Indian life are grouped first, as generally this is the first type of primitive life considered.

Indian Life

158 Little Hiawatha.
168 Minnehaha.
169 Hiawatha and Laughing Water leaving the wigwam.
265 A group of Indians — pageant picture.
98 Pocahontas and John Smith — pageant picture.
182 Mounted Indians.
204 Indian family. Signs of white man's education; trousers; clean, white shirt; felt hat; braided hair. Compare with primitive woman and papoose.
263 Basket making. These Indians live near a white man's town. Note signs of education.

Primitive Homes

359 A bird's home. One of the simplest of homes — a shelter from the storm and from bird enemies; a soft, warm place in which to rear young.
205 Cliff dwellers' home. Prehistoric. Protection from weather and enemies.
265 Indian tent. Hides of wild animals and blankets are used where cloth cannot be bought.

263 Birch bark used for tent covering.
113 A log cabin. Lincoln's birthplace.
281 Home of poor man in Mexico. Made of loose stone and clay. Grass growing and roof.
373 Home of poor people in Scotland. Much like home in 281 except slanting roof. There is more rain in Scotland than in Mexico. Note grass growing on roof. How clean and cared for it is.
372 Inside of cottage in Scotland. Burns' birthplace. Note modern steam radiator beside the primitive fireplace.
549 Simple home in a hot country. In background the bamboo, thatched roof huts.
298 Another hut in a hot country.
546 Simple homes on a river. Houseboats in China. Straw matting for roof, made in sections so that part can be raised at a time.

Some Primitive People

328, 343 In a cold country.
550, 592, 572 In hot country.

Primitive Housekeeping

410 Making bread in Norway.
292 Making bread in Central America. Note also the homemade broom.
550 Making rice flour.
498 Making wheat flour.
409 Spinning wool in Norway.
506 Spinning wool and weaving in India.
563 Spinning cotton in Egypt.

Primitive Farm Work

488 Plowing in Russia. The little boy looks very modern, but the plow is like those used hundreds of years ago.
549 Harrowing in the Philippines.
522 Plowing in Asia.
561 Plowing in Egypt.
562 Threshing beans in Egypt.
479 Threshing grain in Greece. Note pitchfork.
284 Threshing grain in Mexico.

Other Occupations

523 Sawing wood.
516 Rolling a highway. The roller is modern, but the man-power is the most primitive form of motive power.
244 Curing fish in Alaska.

Burden Bearers

572 In central Africa. Burdens carried on the head.
543, 542 In Korea.

518 Wheelbarrows in China.
548 Cattle in the Philippines.
294, 524, 560 Pack Donkeys and Mules.

Receptacles

285 Pig skins for holding liquids.
572 Native baskets and jars.

Markets

469 In Bulgaria.
572 In central Africa.

Clothing

570 Made of bark of trees. The cloaks worn by the man are made of the bark similar to that he is peeling from the tree.
328 Furs in cold climates.
158 Blankets woven by natives and suits of leather.

46. PLANTS AND ANIMALS

By ANNA BOTSFORD COMSTOCK

ASSISTANT PROFESSOR OF NATURE STUDY, CORNELL UNIVERSITY, ITHACA, N. Y. EDITOR "NATURE STUDY REVIEW"

A. PLANTS

1. Apples

44 The man here is spraying the fruit trees with poisoned water so that the little caterpillars of the codling moth that make our apples "wormy" will get a drink of it as soon as they hatch from the egg and die before they bore into the tiny apple. He also sometimes puts substances into the water that kills the fungi which attack the fruit. See view 175 for fruit. *Did you ever find a wormy apple? Do you know the history of the codling moth which causes it?*

2. Bananas

294 If we could imagine the common dooryard weed, plantain, with leaves 20 feet high we would have some idea of the appearance of the banana plant. From 12 to 16 of these great leaves form a giant rosette at the center of which grows a stalk on which appear clusters of tube-like flowers. Each of these flower clusters develops into a bunch of bananas which may weigh from 80 to 100 pounds. In the tropics the fruit is cooked as a vegetable; in Africa a drink is prepared from it, strong mats are made from the fibers of the leaves and the leaves themselves are dried and used to thatch the roofs of the dwellings.

3. Cactus

209 The cactus is a desert plant. Spines are all the leaves which it has. All the moisture which the cactus can gather, it stores up in its fleshy stems and does not waste it by sending it out to evaporate from leaves. This is a picture of the giant cactus which grows in the Arizona desert, and almost every one of them has in it a woodpecker hole. The owls sometimes nest in these holes so the giant cactus is really a bird house. *How many kinds of cacti do you know? Have you seen one blossom? If so, describe it.*

4. Cocoa

303 The cacao tree grows about 20 feet high and has large glossy leaves. The fruit is a great pod from 7 to 10 inches long, which

does not grow upon the little branches like the pod of a locust but springs from the trunk or a large branch as if nailed there. Cacao trees grow wild in Central and South America and are cultivated in many countries. The fruit pod is hard and leathery and has five cells in each of which are 12 or fewer large seeds. These seeds are called beans; they are gathered and prepared by a long process and are finally roasted and ground into powder which is known to us as cocoa or chocolate. South American Indians used cocoa for food and drink long before Columbus discovered America.

5. Coffee

302 Can you see the coffee fruit which these people are picking? Each fruit is red like a cherry and has two seeds at its center instead of one. Coffee blossoms are white and star-like and it requires six or seven months after the blossoms fall before the fruit is ripe. Look at a coffee bean before it is ground and notice the flat side. Place two of the beans, flat sides together, and see how they grow at the center of the fruit.

6. Daisies

72 The common white daisy is not a single flower but each one is a whole bouquet of tiny yellow flowers in the center and white flowers around the edge. The daisy lives in open fields and has so many strong roots and ripens so many seeds that it crowds out the grass and clover from meadows and the cows and horses will not eat the daisy leaves. Thus the daisy is only good for making daisy chains and to look at. *How does the daisy resemble the sunflower? Do you know any other kinds of daisies besides these?*

7. Grapes

236 Grapes have been grown for thousands of years. There are many species, some of them adapted for hot countries and some fitted for the temperate regions. We have in the United States several native species. These wild grapevines often climb the highest trees. The fruit of the grape is a berry and therefore what we call a bunch of grapes is really a cluster of berries. In the past grapes have been grown for the making of wines but now they are grown, in America, more largely for raisins and grape juice and for table use.

8. Orange

28, 237 The orange tree is an evergreen and its leaves shine as though they were varnished. The finest of our sweet oranges is a native of China, while the original wild orange of Seville which was planted in Florida by the pioneer Spaniards has very bitter fruit. Now many varieties have been developed by men, one of the most noted being the naval seedless orange which is grown

so largely in California. The orange trees cannot stand heavy frost without damage.

9. Peach

85 Some trees always wrap their seeds in a pulp which we find most delicious. The peach, plum, and cherry all have this pleasant habit but the most interesting part of the peach, from the peach tree's standpoint, is the pit because of the precious seed contained in its thick shell. When the peach pit is planted the hard shell pushes apart like magic and very soon after the seed within begins to grow. *Do you think that an almond looks like a peach pit? Can you tell how these fruits resemble and differ from each other?*

10. Peanut

118 The peanut grows on a trailing vine. Its flower is small and yellow and shaped somewhat like the flower of a pea or bean. But as soon as the blossom falls a queer thing happens. The branch on which the little pod is forming becomes stiff and pushes it down into the ground where it grows to be a peanut. If the young pod is not pushed into the ground it fails to grow. *In how many different ways is the peanut used? Does its foliage make good hay?*

11. Pineapple

108 The pineapple plant is a native of tropical America. In shape it resembles that of the dandelion only the leaves of the pineapple stand out very gracefully, have many sharp teeth on them, and are from 2 to 3 feet or more in length. From the center of this rosette of leaves arises the fruit stem which at the top is crowded with many flowers in the form of a cone. The fruit develops from these flowers and retains its cone shape and because of this resemblance is called the pineapple.

12. Pumpkin

137 The pumpkin is a beautiful fruit and if it grew on a tree instead of a vine we should think it very wonderful. The pumpkin blossoms are of two kinds and if it were not for the work of bees in carrying pollen from one flower to another no pumpkin would ever grow. The pumpkins were planted by the Indians before Columbus discovered America. *Why are pumpkins planted in cornfields? For what do the farmers use pumpkins? How do the children use them at Holloween?*

13. School Gardens

83 The good gardener knows how to make the plants feel comfortable. To do this the gardener must understand each plant that grows and its needs. He must know what sort of roots it has, its stems and leaves, how its blossoms look, and how the seeds grow, in what sort of soil the plant likes to live, and whether

it needs much or little water. *If you have a garden, are you acquainted with all the plants in it? Do you know the weeds from the garden plants when they first appear?*

14. Sisal Hemp

571, 289 Strong twine and rope are made from the fiber of hemp; but there are three very different plants used to make hemp. Sisal hemp is made from the leaves of a near relative of the century plant called *Agave rigida* which grows in hot countries like Yucatan and Uganda. The leaves grow in a great rosette at the base of the blossom stalks. Each leaf may weigh a pound and a half when fresh but it takes a thousand leaves to produce fifty pounds of fiber. *How does hemp twine differ in looks from other twine? Is it stronger?*

15. Tea

530 The tea plant is an evergreen shrub which is usually allowed to grow about four or five feet high. The young tender leaves are plucked for tea and these have to go through a long process of curing and drying until finally they are in tiny rolls ready for market. We find at the store black tea and green tea which seem very different in color and taste but they both come from the same plant. The colors are produced by different methods of curing. Tea is grown mostly in China, Formosa and India.

B. ANIMALS

1. Alligator

110 Alligators live in the warm waters around the shores of the Gulf of Mexico. The mother alligator makes a nest on the land in which she lays maybe sixty eggs a little larger than those of a hen. She covers the nest with twigs and dead leaves and the hot sun hatches the eggs. Then she takes the whole brood to shallow water where each baby alligator, scarcely more than eight inches long, can find plenty of small fish to eat. The big father alligator can bellow like a bull. *What is alligator's skin used for?*

2. Beaver

196 The beaver is the civil engineer of the animal world. It began building dams across our streams before Columbus discovered America. It cuts down trees with its sharp gnawing teeth so that they will fall across the stream and form the foundation of a dam which it then makes tight and firm with grass and sticks. The beaver needs a pond in which to live and build its house and so it builds a dam and makes the pond in a convenient place to find its food. It feeds upon the bark and twigs of trees which it cuts down and sinks in the water of its dam. *How does the*

muskrat resemble the beaver in its habits? Read "In Beaver World" by Enos A. Mills.

3. Bison — Buffalo

232 The bison is often miscalled "buffalo" but the true buffaloes live in Asia and Africa. The bison used to roam on the western plains in great herds. In 1871 there is record of a herd twenty-five miles long grazing near the Arkansas River. These animals have been hunted and killed until now there are only about two thousand of them left and these are preserved and cared for in our national parks. *Compare the bison with cattle and tell how they resemble each other in form and habits.*

4. Cattle

57, 127 Cattle are raised either for milk or for beef. The Holstein-Friesian (165), the Jerseys (364), and the Ayrshires (371) are leading dairy breeds of cattle. They give great quantities of rich milk which is one of our chief food products. It is sold as milk or made into butter. The Shorthorns (317), Herefords (185), and Angus (370) are important beef breeds. These, with the exception of some of the Shorthorns, do not give enough milk to make them profitable in the dairy. They take on flesh readily and make good beef.

5. Camel

565, 564, 504 The camel is especially fitted to take long journeys in the desert. Its stomach has a special reservoir of cells in which it is able to store water and so after drinking its fill it can go several days before drinking again. The hump on the camel is comprised largely of fat which is stored food and enables a camel to go for some time with only a small amount of food. The camel's feet are broad and flat and are fitted to travel over the soft, hot sand. The camel is so tall that it has to be taught to kneel in order that people can mount or pack merchandise upon it.

6. Chickens

56 The hen lays an egg a day until she has enough to make a nestful. Then she sits on them for three weeks, keeping them warm and turning each egg over carefully every day until the fluffy little bright-eyed chicks break the shells and come out all clothed in down and active, ready to follow their mother about while she scratches the earth and finds seeds and insects for them to eat. *How does the mother hen call her chicks? How does she warn them of danger? How do we know when she has laid an egg? How are her strong toes and beak fitted to help her get her food?*

7. Codfish

13 The cod is a fish of the ocean and when it is fully grown may weigh 150 pounds. More than 600 fishing vessels are sent out from the United States each season to catch the codfish which are dressed and packed in salt when caught and at the end of the season are brought home and dried. Much of the fish sold under the name of codfish is not cod but may be some other kind of fish inhabiting the ocean. *Read "Captains Courageous," by Kipling, which gives the story of the adventures of the cod fishermen.*

8. Eskimo Dogs

279 How tired these dogs look! They have been harnessed to the loaded sledge which may be seen in the picture and have drawn it many miles over snow and bare rock. These dogs are so strong that they are called huskies. They are very much like wolves in appearance and habits. One of these dogs, called "Klondike Jack," pulled 450 pounds 500 miles one winter. See view 246. *In what other countries are dogs used to draw loads? Why are they better than horses for this purpose in very cold countries? Read "Stickeen" by John Muir.*

9. Elephant

509 The elephant is the largest animal we have that lives on land; it is very intelligent and has a wonderful nose which we call a trunk and with which it can pick up a log or a pin. It also has wonderful incisor teeth which we call tusks and which are solid ivory and so large that one may weigh 125 pounds. The young elephants shed these teeth just as we shed our first teeth. See views 505 and 573. *What is ivory used for? Where do wild elephants live? Read "Toomai of the Elephants" in the Second Jungle Book of Kipling.*

10. Elk

189 Of all the deer family, the elk is the most magnificent. A bull elk may weigh as much as 900 pounds and have antlers that spread 60 inches from point to point. The strange thing about the antlers is that they are shed each year and new ones grow out again larger than the year before until maturity. It takes about nine years for an elk to attain full sized antlers which may weigh 50 or 60 pounds. The elk feed upon vegetation but they are especially fond of browsing upon trees and shrubs.

11. Gannet

583 The gannet is a sea bird and closely related to the pelican although it is goose-like in form. The wings of our most common species may measure six feet from tip to tip. Gannets nest upon certain chosen islands and each mother bird lays but one egg in a nest, which is usually a mere depression in the earth lined with a little

seaweed. The common gannet is found along the coast of North America, and other species along the South American and South African coasts. The gannets feed on fish and are of great use to the fishermen in aiding them to locate shoals of fish. These birds fly in single file over the ocean at the height of one to two hundred feet and when the keen eyes of one discovers a fish it drops like a bullet upon its prey and rarely misses it.

12. Geese

216 Geese are valuable for their feathers, eggs, and as food. They were formerly more extensively raised than at present. Before the invention of the metallic pens, goose quills supplied all the pens used. Geese are closely allied to ducks (see view 401) but much larger.

13. Goat

411 The goat is closely related to the sheep but its covering is hair instead of wool. Goats live in herds and, in a wild state, prefer mountainous regions. They are very skilled climbers and are very sure-footed. They feed upon vegetation and chew their food like a cow. They also were used as domestic animals in prehistoric ages. Their hair was woven into clothing, their skins were used for leather and also for carrying water. Their milk is considered very nutritious and from it special kinds of cheese are made. The flesh of the young goats makes very good meat.

14. Hog

183 From a very early period indeed the hog has been a domesticated animal. Its flesh provides a large part of the food of many nations. The skin of the hog is made into leather. The bristles are much used for making brushes. For packing house views. See 142 to 144.

15. Horse

398 Look at these horses and see how strong and large their shoulders and necks are and how big and firm are their feet. France and Belgium and England all have developed breeds of horses famous for their ability to draw heavy loads. See views 138 and 71. *Where does a strain come upon a horse in drawing a heavy load? Why does it need big firm feet to do this work? How does a draft horse differ from a trotting horse in form?*

16. Kangaroo

558 When any creature has long, strong hind legs it is sure to be a great jumper whether it is a grasshopper, a frog, a rabbit, or a kangaroo; twenty-five feet at one leap and ability to keep it up for miles is the record of the kangaroo. The mother kangaroo has a pouch in which she carries her babies just like our opossum. The kangaroo lives upon grass and its home

18. Moose

2 The moose is the largest species of all the deer family. moose has antlers that sometimes measure six feet f tip, and may weigh ninety pounds. Moose get thei browsing on the leaves of shrubs and trees; they are g mers. The cow moose has no antlers; it is the cow mo in the picture. *Do you know in what part of Nort the wild moose are still found?*

19. Ostrich

239 Here we see two baby ostriches just out of the another egg which has just been pipped. An ostri about six inches long and equal in contents to two dc eggs. Back of the fence you can see the full grown bir are the largest birds we have. They live in a wild Africa but are now raised for their plumes (quill feath wings and tail) as we see in this California scene. are big and powerful and able to deliver a kick almost that of a horse. A full grown male ostrich stands fi feet high and weighs almost 200 pounds.

20. Oyster

86 The oyster has such a soft body that it needs its shell t it. Although it is so soft, it has a mouth, stomach, li and gills. When first hatched the young oyster can m but soon settles and grows fast to some object. It shallow salt water. It has two shells which are hi which it can open when it is feeding and can shut w frightened. *Where are oysters grown? For what a shells used?*

22. Reindeer

413 In the cold and frozen north regions this animal takes the place of both horse and cow. The reindeer is brownish-grey in color; its hair is an inch thick to keep it warm. Both the males and females have antlers. They have large dewclaws and large crescent-shaped feet which serve as snowshoes. Reindeer live upon the hard dry little plants that we call lichens and they have to dig them from under the snow very often. They were domesticated long ago by the Laplanders. They are used to draw the sledges and their milk and their flesh are used for food. The United States Government in 1891 introduced the reindeer into Alaska. Our native caribou belongs to the reindeer family.

23. Salmon

226 The salmon are among the best food and game fishes in the world. After they are grown they live in the ocean but they come back to the fresh water streams in great schools to lay their eggs. It is when they are coming back for this purpose that they are caught in the nets and killed by the tens of thousands for the markets and canning factories. *Where does the canned salmon which we eat come from? Read "The Story of a Salmon" by David Starr Jordan to learn the life history of one of these interesting fish.*

24. Seal

345 The fur seal is awkward on land but is a wonderful swimmer although it is a mammal and not a fish. It lives in the water most of the time and feeds upon fish and mollusks. In the spring the seals go to favorite islands where the "pup" seals are born and all these young ones live together in thousands; but each mother can go away and get food and come back and pick out her own baby to feed without making any mistake. *Why do the Eskimo hunt and kill the seals? For what is seal skin used? Describe the seal fur.*

25. Sheep

173 The sheep are cud-chewing, hollow-horned, hoofed animals; they feed upon grass and herbage, but can also live upon moss and lichens in the high mountains. In some species only the males have horns, in others the females also have them. Sheep have been domesticated since before the dawn of history. Their wool has been used to make clothing, their skins have been used for leather and clothing, their flesh for food. There are many domestic varieties of sheep. The handsomest of all wild sheep is found in North America. It is the bighorn or Rocky Mountain sheep.

26. Sponge

111 The sponge which we use when we take a bath is the skeleton of a very peculiar animal. Its flesh is just like jelly and it covers the whole sponge. It lives grown fast to some rock below the surface of the water. It pumps water through the many pores of its flesh and skeleton and gathers from the water material to eat. The baby sponge can swim about. *How are sponges prepared for market?*

27. Whale

415 The whale is not a fish although it lives in the water. It is warm-blooded and the mother whale feeds her young calf on milk just as a cow feeds hers. The whale breathes air by coming to the surface and filling a breathing chamber with fresh air and then dives and remains under water for some time. When it next comes up for air it spouts out the impure air in a fountain of spray. The whale is the largest animal in the world as it sometimes is seventy-five feet long and it may require a hundred years to get its growth. *What is whalebone? For what is whale oil used?*

47. READING

By CHARLES MADISON CURRY, A.M.

PROFESSOR OF LITERATURE IN THE INDIANA STATE NORMAL SCHOOL, TERRE HAUTE, IND.

One of the most important problems for the teacher of reading is that of securing the proper visualization or image in the pupil's mind. That means that the reader's mind must act somewhat as a moving picture machine and produce a series of clear and connected images. The language of a poem or story suggests these images for us.

As life becomes more complex and each individual tends to confine his experiences to one small part of the world's activities, he is likely to have a body of experiences too narrow for fully interpreting much that he reads. When the larger portion of our population was rural and most of the processes concerned in producing food and clothing and other common needs passed before the eyes of almost every individual, an extended common body of experiences could be assumed as a basis upon which to build. But the rapid growth of cities and industrialism has changed all this.

Older teachers who spent their childhood in the country are constantly surprised at the growing inability of children to understand some of the passages in such a simple poem as Whittier's "Snow Bound." The fact is that "Snow Bound" is no longer a simple poem, since few children have the opportunity nowadays of a group of winter experiences which practically all children had sixty years ago. The passage telling the manner in which the fire was built "as night came on" falls on deaf ears. Such terms as "backlog," "backstick," "forestick," have to be explained in some concrete fashion. The modern furnace offers no point of contact with the old-fashioned fireplace, and the open fire of coal offers little more. The "well sweep" and the "well curb" are entirely outside the pupils' world. With small knowledge of the habits of bees, they are unable quickly to understand what the poet means when he speaks of the marshes as "mile wide as flies the laden bee."

Such deficiency must be overcome in some way. Language must be alive. It is alive to the user when it grows directly out of definite experiences, and it is alive to the listener or the reader when it suggests definite meanings and images to him.

In primary classes, children are at first generally taught words that name familiar objects, such as dog, cat, horse. Before the word is given, the object (say, a dog) is called before the mind by means of a conversation in which the children are encouraged to talk about interesting dogs they have known and, in various ways, the story or meaning or image to be associated with the word is made definite. Many pictures of dogs may be brought by members of the class or by the teacher. Primary teachers find pictures or other concrete illustrations an absolute necessity in all lines of work.

The "600 Set" contains many pictures that will help give a background for much of the reading work. It should, of course, be kept in mind that the pictures have not been made to interpret the story or poem. They deal with the raw material out of which the story or poem has been constructed. Sometimes only a portion of the picture can be helpful, perhaps a child in the foreground or a mountain in the distance. For instance, in the well known fairy story of "The Snow Queen" there is a good deal about a reindeer, Lapland, Finland, and the cold regions of the north. At one place in the story the Snow Queen refers to Mt. Etna and Mt. Vesuvius as her "black kettles." Some or all of the following group could be used to advantage in illustrating the background of it

I. READING FROM TEXTBOOKS

THE SNOW QUEEN

413 Reindeer.
414 Midnight sun.
481 Fish wives of Finland.
453 Mt. Vesuvius.

A CHILD'S GARDEN OF VERSES

By Robert Louis Stevenson

Some of Stevenson's poems in this book admit of the same kind of suggestive illustration. The seven titles following are taken from it.

Foreign Children

158 "Little Indian, Sioux or Crow."
343 "Little frosty Eskimo."
474 "Little Turk."
534 "Or Japanee."
239 Ostriches and their eggs.

Singing

359 "Of speckled eggs the birdie sings,
And nests among the trees;
217 The sailor sings of ropes and things,
511, 525 In ships upon the seas.
530, 532, 535 The children sing in far Japan.
437 The children sing in Spain."

The Cow

356, 403 "The friendly cow all red and white."
57, 403 "She gives me milk."

Travel

493 "Mosque and Minaret."
524 "Where the Great Wall round China goes."
568 "Some deserted city."
504 "With a camel caravan." (The camels can be seen going up the street.)

Where Go the Boats

33, 52, 242, 254, 511, etc. "Where go the boats?"
39, 397 "Dark brown is the river."
564 "Golden is the sand."

Historical Associations

480 "Simple Shepherd's Land."

I Have a Little Shadow

353 The regulator of the world's clocks.
355 "A little shadow that goes in and out with me."

The Swing

Let children select some picture showing what they might see if they could "go up in a swing, up in the air so blue."

THE WORLD

By W. B. Rands

38 A beautiful valley landscape.
90 A view over Washington.
126 Where Davy Crockett lost his life.

158 Nokomis and the little Hiawatha. "Nursed the l
Rocked him in his linden cradle."
168 Paying honor to Minnehaha. "Brought forth food
them, Brought them water from the brooklet."
169 Hiawatha and Minnehaha departing in the birch c
the wigwam he departed, Taking with him Lat
265 Indian encampment by a river.
184 The feast of Mondamin. "It is Mondamin! Yes,
man, Mondamin."

INDIAN STORIES

204 An Indian family in Colorado.
244 Indians drying fish in Alaska.
263 Indians weaving baskets.
328 Indians of southern South America.

STORIES OF HOLLAND

52 The great ocean liner to carry us across the Atlantic
400 Where we may land in Holland.
399 One of the quaint scenes in Holland, including a wi
401 An interesting fishing village in Holland.
402 Some of the children seen in a village street.
403 Milking scene on a farm in Holland, with windmill
tance.

STORIES OF ABRAHAM LINCOLN

113 Abraham Lincoln's early home.
91 Abraham Lincoln as President.
73 Abraham Lincoln in the Civil War.
146 Abraham Lincoln as a living influence.

STORIES OF GEORGE WASHINGTON

NUREMBURG

By Longfellow

387 "Quaint old town of toil and traffic, quaint old town of art and song."

THE CHILDREN

By Longfellow

72 "Oh, what would the world be to us, if the children were no more?"

BREAK, BREAK, BREAK

By Tennyson

382 Sea breaking on a rockbound coast.

AMERICA

By Smith

1, 2, 6, 7, 8, 10, 25, 38, 61, 71, 72, 87, 88, 89, 90, 91, 110, 117, 127, 178, 182, 188, 190, 198, 207, 208, 215, 221, 222, 224, "My country, 'tis of thee." (It is a good plan to give children an idea of what "my country" really means, and of how many people may say it.)

222, 228 "I love thy rocks and rills."

38, 39 "Thy woods and templed hills."

HOME, SWEET HOME

By Howard Payne

60, 91, 384 "Mid pleasures and palaces tho' we may roam."

373 "Be it ever so humble, there's no place like home."

96, 354, 355, 373 "There's no place like home."

WHO STOLE THE BIRD'S NEST?

By L. M. Child

356 "'Not I,' said the cow."

480 "'Not I,' said the sheep."

ANIMAL STORIES

110 Alligator; 196 Beaver; 549 Buffalo; 565, 564 Camels; 118, 204, 246, 279 Dogs; 341, 522, 557 Donkeys; 505 Elephants; 189 Elk; 411, 447 Goats; 138, 204 Horses; 588 Kangaroo; 2 Moose; 172, 183 Pigs; 413 Reindeer; 345 Seals; 173, 190, 480 Sheep.

MISCELLANEOUS

452 "Androclus and the Lion."

555, 494, 557, 558, 560, 562, 563, 564, 565 Stories of Arabs.

398 "Black Beauty." By Anna Sewell.

399 "Blow, wind, blow; and go, mill, go."

365 to 373 Stories of Bruce.
530, 532, 534, 535 Boys and girls of Japan.
520 The Chinese school.
513 to 524 Chinese stories. "Aladdin" had its setting in China.
56 Chickens.
72 "Daisies." Poems by Christina G. Rosetti and by Frank Dempster Sherman.
348 to 352 Dick Whittington, Lord Mayor of London.
365 to 373 Stories of Douglass.
445, 449 "The Fir Tree." By Hans Christian Andersen.
159, 353 "The Foolish Weathercock."
475 to 480 "Stories of Ancient Greece."
131, 132, 133 Charles Goodyear.
594, 595 "Lady Moon." By Lord Houghten.
401, 402 "The Leak in the Dike." By Cary.
60, 382 "Little Drops of Water."
158, 204 "Little Papoose."
130 Making maple sugar.
173 "Mary had a little lamb."
72 "O, the pretty flowers!"
104, 105 "One Little Bag of Rice." By Thomas Smith.
407 to 414 Old Norse legends.
98 Story of Pocahontas and John Smith.
359, 204 "Rock-a-bye, baby, in the tree-top."
450 to 452 "Stories of Ancient Rome."
480 "The Shepherd." By Wm. Blake.
525, 27 "A ship, a ship a'sailing."
217 "A'sailing on the sea."
356, 403 "Thank you, pretty cow."
411, 447 "Three goats named Gruff."
596 to 599 "Twinkle, Twinkle, Little Star." By Jane Taylor.

II. SUPPLEMENTARY READING

No reading course today is confined to the school reader. To be sure there always must be an intensive study of certain selected pieces of literature in order that children may be taught *how* to read. But knowing how is not enough, they must be led to do it. All during life, reading must be the chief method by which knowledge will be obtained. The reader will be intelligent. In school then, supplementary reading is introduced in order to give children breadth of ideas and some knowledge of the wealth of books about them.

Teachers will find that the Keystone stereographs in themselves furnish a supply of supplementary reading of a very fine quality. The descriptions on the backs of the views are written

in clear and simple English for the special use of children. They contain a wealth of good reading matter in a wonderfully fluid form so that their uses are almost illimitable. One day the views may be selected so as to give a geographical reader full of most interesting facts. Another day an historical reader may be made, or a book of industries or of people. More people get knowledge through the eyes than through the ears. These views may be used as supplementary reading so as to give much needed training in this line. In most reading classes all the children have books and each may get the thought for himself, keeping only so much track of the reader as will enable him "to keep the place." When the Keystone Views are used as the reader, only one child can read at one time. He must give the meaning to the others, they must get it from him. Such lessons are invaluable, giving expression, attention and self-control.

Some few books, such as "Carpenter's Geographical Readers," "Seven Little Sisters," etc., seem to be almost universally selected for supplementary reading, and these are readily visualized by the Keystone Views. This combination of books and views cannot be surpassed.

A. SEVEN LITTLE SISTERS

By Jane Andrews (Ginn and Co.)

The Little Brown Baby

554 A tropical scene. "Far away in the warm country." P. 5.
551 Coconuts. "She drinks the sweet milk of the coconut from a round cup made of its shell." P. 6.

Agoonak

342 Greenland. The kind of country in which Agoonak lives.
345 Antarctic regions. "The seals love best to live in the seas of the cold countries." P. 11.
413 Laplanders. The reindeer "is their kind, gentle, and patient friend." P. 16.
346 Norway. From ice fields such as these "the great white whale came swimming down from the far north." P. 21.

Gemila

565 The Sphinx and Pyramid, Egypt. "Did you ever see a camel?" P. 29.
494 Syria. An Arab and his horse. P. 30.
504 India. A camel caravan. (Notice the shadows.) P. 32.

239 Ostrich farm, California. "See, there is the ostrich!" P. 35.
564 Nile River, Egypt. "Green feathery tops of the palm trees." P. 40.

The Little Mountain Maiden

443 Switzerland. "A little chamois — carved of wood." P. 43.
448 Switzerland. "Those high snowy peaks." P. 43.
445 Switzerland. "This small house upon the great hills." P. 44.
447 Switzerland. "She should go with him on market days, to sell the goats' milk cheeses." P. 48.
444 Switzerland. "Over the green grass, over the rocks, far up among the snow and ice, and the frozen streams that pour down the mountain sides." P. 50.
446 Switzerland. "Among the mountains the echoes answer each other again and again." P. 51.
443 Switzerland. The wood carver. P. 52.

The Story of Pense

514 Yangtse River. Houseboats, Hongkong, China. P. 59.
517 Hankow, China. "Here it was that Pense saw the little lady in the house on the hill." P. 61.
520 Peking, China. Where "the little lady" goes to school.
521 Chifu, China. "Store of a great merchant." P. 63.
530 Shizuoka, Japan. "When the tea leaves were in bloom." P. 69.
537 Japan. "Mulberry trees, with their purple fruit and white." P. 69.
538 Japan. "The little worms that eat the mulberry leaves." P. 69.
539 Japan. "Spin for themselves a silken shell, and fall into a long sleep inside of it." P. 69.
540 Japan. "Spin off the fine silk and make it into neat skeins." P. 69.

The Little Dark Girl

592 Fiji Islands. Some of Manenko's people.
578 Rhodesia, S. A. "The chief is very proud and happy to bring home such a load." P. 80.
573. Mombasa, S. A. Where ivory is shipped. P. 80.
557 Tunis. "Oh, what mighty beasts!" P. 82.
572 Central Africa. "These are simple, happy people." (Notice ornaments.) P. 83.
576 Rhodesia, S. A. "The wonders of the things about them." P. 84.

Louise, the Child of the Beautiful River Rhine

392 Germany. "Have you heard of the beautiful River Rhine?" P. 85.
391 River Rhine, Germany. "Sweeping between the high hills." P. 85.
390 Rudesheim, Germany. "Here the grapes are hanging in heavy purple clusters." P. 92.

Louise, the Child of the Western Forest

386 Hamburg, Germany.
25 The Statue of Liberty, New York Harbor.
30 New York City. "They are to stop but two days in this city." P. 102.
32 Ellis Island. Where "they reached the land again." P. 104.
113 Log cabin. The kind of house they lived in. P. 107.

B. CARPENTER'S GEOGRAPHICAL READERS

(*American Book Company*)

1. North America

102 Blue Ridge, S. C. "The green Appalachians." P. 14.
221 Mt. Hood, Ore. "The lofty, snow clad peaks of the Rocky Mountain highland." P. 14.
189 Wild elk, Montana. "There are wild animals in the mountains." P. 16.
43 Central New York. "The United States has more railroads than has any other country." P. 17.
93 Washington, D. C. "The circles and triangles are filled with statues, fountains, flowers and trees." P. 21.
91 The White House. "The roadway which leads to the great porch before the front door." P. 27.
92 Washington, D. C. "Later on we are shown the Cabinet room." P. 31.
90 Washington, D. C. "Down Pennsylvania Avenue to the National Capitol." P. 31.
87 The Capitol, Washington, D. C. "It appears like a huge marble palace with a great white dome." P. 31.
88 President Wilson reading message. "We are in the hall of the House of Representatives." P. 31.
89 Supreme Court room. "We can go into the same room." P. 34.
100 Hampton Roads. "A country like ours must have many warships to defend it." P. 37.
242 San Diego Bay, Cal. "There are torpedo boats, which travel below the surface of the water and send out bombs." P. 38.
94 Bureau of Printing and Engraving. "Scores of men and women are busy printing bank notes." P. 41.
86 Shucking oysters. "There are in Baltimore many thousand men and women who do nothing but take the oysters out of their shells." P. 52.
97 Hampton, Va. "There are also oyster farms . . . where the seed oysters are put and where shells are thrown into the water to which the young oysters can fasten themselves." P. 52.
81 Philadelphia, Pa. "Thousands are busy weaving woolen cloths." P. 55.
82 Baldwin Locomotive Works. "Others who are doing work in iron and steel." P. 55.

80 Old Liberty Bell. "We visit Independence Hall, where the Declaration of Independence was adopted." P. 57.
84 Philadelphia mint. "The coining is done by the coining machine." P. 62.
30 Broadway, New York. "The chief business street of New York. . . . How lively it is and how noisy!" P. 66.
25 New York City. "How high the buildings are!" P. 68.
28 New York City. "We walk up Broadway past City Hall Park." P. 68.
29. New York City. "We are in the Wall Street section." P. 69.
31 New York City. "Let us . . . take a ride to the lower part of the island." P. 72.
26 Ferry slips, New .York. "New York has twenty-five miles of water front on Manhattan Island alone." P. 75.
52 Docks, Hoboken, N. J. "A procession of steamers is always moving back and forth." P. 76.
32 Ellis Island, New York. "We visit the place where these immigrants land." P. 79.
27 Brooklyn Bridge, New York. "It is an immense structure of stone and steel." P. 81.
14 Lawrence, Mass. "Many kinds of cotton goods come from its factories." P. 86.
15, 16 Lawrence, Mass. "Huge mills which make ginghams, muslins, calicoes." P. 86.
17, 18 Lawrence, Mass. "A large part of woolen goods of the United States is made in New England." P. 87.
19, 20 Holyoke, Mass. "In Massachusetts are some of the biggest paper mills of this country." P. 87.
21 Providence, R. I. "There are large factories in Rhode Island which make beautiful jewelry." P. 87.
11 Lynn, Mass. "Let us visit one of the shoemaking establishments." P. 91.
41 Syracuse, N. Y. "Machines that will sew six hundred pairs of shoes in a day." P. 92.
12 Lynn, Mass. "Each part of the shoe is made by a different machine." P. 92.
1 Logs, Aroostook Co. "Maine has large forests of pine and other trees." P. 95.
13 Gloucester, Mass. "They catch millions of dollars' worth of fish every year." P. 95.
3 Concord, N. H. "Cut into blocks, to be shipped to all parts of our country." P. 96.
4 Proctor, Vt. "More care is used in getting out marble." P. 96.
5 Proctor, Vt. "They are carefully smoothed and polished." P. 96.
130 Maple sugar tree. "Holes are then bored in the trees not far above the ground." P. 98.
7, 8 Quincy Market and Faneuil Hall; Old State House. "Everywhere in Boston we see things which remind us of the stirring times of the past." P. 102.

6 Boston, Mass. "We next visit the old North Church." P.-104.
10 Lexington Common, Mass. "In the books you have read
How the British regulars fired and fled." P. 104.
109 Old slave market. "They were kept in slavery until freed during the great Civil War." P. 108.
118 Harvesting peanuts. "The vines are then dug up . . . with the nuts hanging to them." P. 110.
112 Tobacco field, Kentucky. "We see tobacco fields everywhere." P. 115.
117 Mississippi plantation. "Negroes and whites walk through the rows and pull the soft white lint from the stalks." P. 118.
124 Greenville, Texas. "After picking, the cotton is carried to the gin." P. 121.
125 Greenville, Texas. "The men throw the cotton into the top of a machine so that it falls between fine circular saws so arranged that the seeds can just pass between them." P. 122.
14 Lawrence, Mass. "Rolled upon long spools, called spindles, by what is known as the mule spinner." P. 126.
104 Rice fields, South Carolina. "The fields have little banks about their edges." P. 130.
105 Hoeing rice, South Carolina. "The soil is then plowed and hoed." P. 130.
106 Along the wharf. "Brings us to Savannah, a thriving seaport." P. 134.
107 A turpentine farm, South Carolina. "There are farms of this kind all along our South Atlantic coast." P. 135.
110 Palm Beach, Fla. "Alligators by the hundreds crawl through the muddy waters." P. 139.
108 Harvesting pineapples. "In southern Florida we see great fields of pineapples." P. 148.
120 Mississippi Delta, La. "We enter the Mississippi River through . . . one of its mouths." P. 149.
119 Levee, New Orleans. "Hundreds of thousands of bales . . . are sent from here every year." P. 156.
198 Greeley, Col.; 270, 271 Montreal, Can. "In the western part of our country a great deal of sugar is now made from beets." P. 158.
148 East St. Louis, Ill. "The Mississippi River is very hard to control." Pp. 167, 168.
174 St. Louis, Mo. "We look at the huge bridges across the Mississippi." P. 172.
184 Corn field, Kansas. "We are . . . looking over a sea of green leaves, spotted with the golden tassels." P. 173.
136 Corn cutter and binder, Ind. "The corn crop is now ready for harvest." P. 173.
137 Indiana. "Cut and shocked." P. 173.
180 Omaha, Neb. "Turn under the tough sod." P. 179.
179 South Dakota. "Harrowed in much the same way." P. 179.

199 Fort Collins, Col. "Stand them on end in shocks." P. 180.
177 Red River Valley, N. Dak. "More than one thousand bushels of wheat in a day." P. 180.
233 Harvester, California. "These great machines are often drawn by steam engines." P. 181.
218 Reaper and thresher, Washington. "Or by teams of from twenty-five to thirty horses and mules." P. 181.
167 Street scene. "Minneapolis is a fine city." P. 183.
157 Houghton, Mich. "Ships loaded with copper from the mines of the Michigan peninsula." P. 187.
154 Sault Ste. Marie,-Mich. "We are in the famous lock of the Soo Canal." P. 190.
163 Mesabi Range, Minnesota. "Our richest beds of this ore . . . are about Lake Superior." P. 193.
164 Two Harbors, Minn. "A fleet of fast steamers is kept busy carrying the ore down the Great Lakes to the furnaces." P. 193.
156 Calumet, Mich. "The golden liquid is poured into the molds." P. 198.
162 Minnesota pineries. "A load of logs big enough to fill an ordinary bedroom." Pp. 202–203.
48 Mouth of Canal. "The Erie Canal, which has its terminus at Buffalo." P. 209.
128 Conneaut, Ohio. "The iron ore docks." P. 212.
49 Niagara Falls — summer. "Then take their hundred-and-sixty foot leap downward into the great abyss below." P. 214.
50 Niagara Falls — winter. "How the river thunders as it dashes over the rocks!" P. 216.
122 Beaumont, Tex. "Derricks must be erected." P. 222.
69, 70 Oil field, Pennsylvania. "A torpedo of nitroglycerin is put down into the bottom of the well and exploded." P. 222.
103 Sapphire Co., N. C. "He had to make the charcoal." P. 229.
76 Scranton, Pa. "Anthracite coal is almost as hard as stone." P. 230.
79 Ashley, Pa. "This is done in what is known as a coal breaker." P. 232.
78 Scranton, Pa. "They are then run through inclined troughs, or chutes." P. 232.
129 Conneaut, Ohio. "Vast amounts of coal are shipped from Pittsburgh to many parts of our country." P. 233.
75 Hazelton, Pa. "Let us go into one of the mines." P. 234.
77 Scranton, Pa. "A little railroad track which has been made for the coal cars." P. 234.
61 Pittsburgh, Pa. "Where the Monongahela and Allegheny rivers flow together." P. 236.
116 Steel furnace. "Birmingham, [Ala.] . . . promises some day to rival Pittsburgh in its product of iron and steel." P. 236.
68 Connellsville, Pa. "They are the coke ovens." P. 238.
62 Pittsburgh, Pa. "The smelting furnaces are immense round iron tanks." P. 240.

64 Pittsburgh, Pa. "Ready to be shipped to different parts of the country." P. 242.

65, 66, 67 Pittsburgh, Pa. "The wonderful processes of turning iron into steel." P. 243.

139 Chicago, Ill. "Huge stone and brick structures from ten to twenty or more stories high." P. 247.

140 Stock yards, Chicago. "At times there are several hundred thousand animals in the yards." P. 254.

142, 153, 144 Chicago. "We follow the hogs." P. 256.

201 Colorado. "The Garden of the Gods . . . filled with huge rock formations." P. 260.

206 Arizona. "Great forests which have been turned into stone." P. 261.

274 Canadian Rockies. "Glaciers more wonderful than those of the Alps." P. 261.

207 Grand Canyon, Ariz. "In one place . . . more than a mile deep." P. 262.

208 Grand Canyon, Ariz. "He seems to be flying by mighty cities, dashing under huge forts, and past enormous cathedrals." P. 262.

214 Mining camp, Nevada. "Towns have sprung up . . . to accommodate the miners." P. 264.

225 Hydraulic mining, Oregon. "Threw the water against the sides of the hills." P. 265.

203 Ouray, Col. "We shall then follow it to the mill." P. 266.

186 Geneseo, Kan. "Where there is water, large herds of cattle can be pastured upon the high plains." P. 258.

190 Idaho. "Great flocks of sheep." P. 283.

212 Utah. "Salt Lake City. It lies in a valley, surrounded by mountains." P. 284.

210 Phoenix, Ariz. "These deserts might be made to pay." P. 290.

237 San Gabriel Valley. "The oranges here seem even bigger and sweeter." P. 295.

234 San Joaquin Co., Cal. "Orchards loaded with almonds." P. 295.

236 Acampo, Cal. "Vineyards of the choicest grapes." P. 295.

229 Yosemite Valley. "The biggest trees of the world." P. 301.

228 Yosemite Valley. "Leaps over the rocks down into the valley." P. 304.

230 San Francisco. "One of the largest and most prosperous of our cities." P. 306.

224 Oregon. "Some of the biggest forests of the United States are to be found in the Pacific Northwest." P. 312.

217, 216 Washington. "Some of the best timber in the world comes from this region." P. 312.

215 Columbia River, Wash. "The long trees are cut into logs." P. 312.

226 Columbia River, Ore. "Caught by nets and traps in great numbers." P. 316.

227 Astoria, Ore. "Canned and sent to all parts of the world." P. 317.
219 Ranier National Park, Wash. "The grand white cone of Mount Tacoma." P. 318.
195 Rocky Mt. Divide, Wyo. "Parts of which are covered with woods." P. 322.
191 Yellowstone Park. "Full of natural wonders." P. 322.
192 Yellowstone Park. "Falls into one semicircular basin after another." P. 322.
193 Yellowstone Park. "Another fountain is always vomiting forth masses of green, slimy mud mixed with sulphur." P. 323.
194 Yellowstone Park. "Old Faithful sends up . . . an immense volume of steam and boiling water." P. 324.
197 Yellowstone Park. "A fall . . . almost twice that of the American Falls at Niagara and a gorge far more wonderful." P. 324.
187 Butte, Mont. "The largest output of copper . . . in the world." P. 326.
204 Ute Indians, Col. Indians "now dress much like white people." P. 329.
158 Hiawatha picture. "That is a papoose, or an Indian baby." P. 329.
98 Pocahontas and John Smith. "Dangerous and cruel foes." P. 332.
243 Chilkoot Pass. "Alaska has high mountains." P. 336.
245 Placer mining, Alaska. "Millions of dollars' worth of gold are now being taken out of the sand and earth." P. 350.
279 Labrador. "We meet . . . some Eskimos in furs." P. 354.
2 Maine. "Moose hunting is by no means child's play." P. 356.
278 St. John's, N. F. "The greatest cod-fishing grounds that have ever been known." P. 358.
276 Mt. St. Donald, Canada. "We fly past glaciers." P. 364.
277 Vancouver, B. C. "It owes its growth to . . . this excellent harbor." P. 364.
273 "Winnipeg is the capital of Manitoba." P. 366.
267 Montreal, Can. "Immense cargoes of grain." P. 369.
280 Mexico. "We land in Vera Cruz." P. 376.
284 Mexico. "The farmers use the poorest of tools." P. 383.
289 Yucatan, Mex. "It is henequen, or sisal hemp." P. 383.
285 Making pulque, Mex. "The juice . . . turns into a beer." P. 384.
282 Mexico City. "We see that the roofs are flat." P. 386.
290 Mexicans. "The Mexicans are fond of music and they spend much time out of doors." P. 387.
283 Mexico City. "Chapultepec, the great hill." P. 388.
281 Mexico City. "Such slaves are known as peons." P. 389.
292 Salvador, C. A. "The women are their own millers." P. 390.
287 El Oro, Mex. "Much silver has come from Mexican mines." P. 391.
288 Cholula, Mex. "Popocatepetl . . . which is visible from any part of Mexico City." P. 392.

294 Costa Rica. "The chief market for the bananas is the United States." P. 394.
247 Panama canal zone. "There are also India rubber trees." P. 398.
131 Crude rubber, Akron, Ohio. "Smoked to harden it into cakes for the markets." P. 399.

a. South America

249 Colon, Panama. "See the palm trees shading the houses." P. 16.
254 *U. S. S. Missouri.* "The canal was completed August 15, 1914." P. 20.
251, 250 Panama Canal. "Something of the great work Uncle Sam has accomplished in the construction of this mighty ditch." P. 21.
253 Panama Canal. "That wall of green is the Gatun Dam." P. 23.
252 Panama Canal. "The deck is soon high above the walls." P. 23.
255 Hospital grounds, Panama. "The streets go uphill and down." P. 28.
256 Panama. "A great bay which is guarded from the sea by green islands." P. 28.
337 A street in a Colombian city. "White buildings covered with plaster." P. 31.
336 Guayaquil, Venezuela. "There is not a chimney rising above any of the houses." P. 39.
333 Near Lima. "Sugar cane is one of the chief crops of Peru." P. 54.
332 Lima, Peru. "Many of the rich farmers use steam plows and harrows." P. 54.
330 Peru. "We shall go there upon one of the steepest railroads of the world." P. 67.
334 Peru. "The Andes of this region are noted for their mineral deposits." P. 73.
335 Bolivia. "The odd little animals which act as beasts of burden upon this highland." P. 75.
331 Cuzco, Peru. "Ruins of the great temples which the Spaniards found in the days of Pizarro." P. 77.
329 "Arequipa, one of the chief cities of Peru." P. 84.
326 Chile. "Come to anchor in the Bay of Valparaiso." P. 109.
327 Valparaiso, Chile. "They are loading and discharging goods." P. 111.
323 Juncal, Chile. "We shall ride over the railroad to the top of the mountain." P. 119.
321 Andean Foothills. "On one side we could see the pampas of Argentina." P. 122.
322 Andes, Chile. "We must be satisfied with the magnificent views we have had as we rode through the pass. P. 122.
324 Santiago, Chile. "That big building over there is the Cathedral." P. 128.
328 Indians on Straits of Magellan. "The women let their hair grow so that it hangs down over their shoulders." P. 166.

317 La Plata. "In these pastures is found the chief wealth of Argentina." P. 174.
319 Argentina. "We enter a land of great vineyards." P. 183.
320 Argentina. "Carts which have come in from the farms." P. 186.
314 Buenos Aires. "Just the point where steamers from Europe can most easily land their goods." P. 192.
315 Buenos Aires. "The government house, where the President of Argentina has his offices." P. 196.
316 Palermo, Argentina. "This park is one of the finest in all South America." P. 200.
313 Montevideo, Uruguay. "Extensive harbor improvements have had to be made." P. 201.
312 Montevideo, Uruguay. "We ride by . . . two-story and three-story houses, now passing great plazas, or squares, filled with trees." P. 205.
309 Sao Paulo, Brazil. "One of the most enterprising cities of the republic." P. 255.
308. Sao Paulo, Brazil. "It is more like one of our own towns than any South American place we have yet seen." P. 255.
310 Sao Paulo, Brazil. "Great fields paved with cement, upon which the coffee beans are dried in the sun." P. 263.
311 Sao Paulo, Brazil. "Ready for shipment." P. 266.
307 Rio de Janeiro. "Covered with the rich green of the tropics." P. 267.
305 Rio de Janeiro. "The main street is the Avenida Central." P. 274.
306 Rio de Janeiro. "Rio has many rich citizens." P. 275.
304 Bahia, Brazil. "These bluffs rise almost straight up from the water." P. 283.
247 Rubber tree, Panama. "With a hatchet he makes a gash in the bark." P. 316.
341 Caracas. "A little back from the seacoast is a nest in the mountains." P. 336.
340 Venezuela. "Later on we visit the Caracas University." P. 340.

3. Europe

52 Docks, Hoboken, N. J. "Our ship is one of the greyhounds of the Atlantic." P. 12.
25 New York City. "Past the tall buildings of lower New York." P. 13.
374 Ireland. "We soon find ourselves at anchor in the harbor of Queenstown." P. 15.
379 Kenmare, Ireland. "We do not wonder that the country is called the Emerald Isle." P. 16.
375 Cork. "We walk down St. Patrick Street." P. 21.
376 Blarney Castle. "We try our best to kiss the famed Blarney Stone, set into the wall below." P. 23.
377 Lakes of Killarney. "A picture wonderfully beautiful." P. 25.

378 Ireland. "'Irish coal,' peat, is a spongy, vegetable matter which might be called half-grown coal." P. 25.
380 Ireland. "Dublin is a magnificent city." P. 27.
382 Giants' Causeway. "We see acres of huge stone columns rising out of the sea." P. 29.
381 Ireland. "We find Belfast full of interest." P. 31.
369 Scotland. "Through the scenes described in Sir Walter Scott's poem, 'The Lady of the Lake.'" P. 42.
373 A Highland home. "All the Highlands of Scotland are beautiful." P. 42.
367 Scotland. "We stop at Stirling to see the great castle." P. 42.
366 Highlanders. "At first we hardly know whether they are women or men." P. 43.
365 Scotland. "We are delighted with Edinburgh." P. 44.
366 The Great Forth Bridge. "An enormous structure of stone, iron, and steel, more than a mile and a half long." P. 45.
372 Robert Burns. "We visit the cottage in which he was born." P. 46.
358 England. "Some beautiful cattle." P. 50.
357 England. "They are good farmers, and they have the best farming tools." P. 50.
347 Liverpool. "The magnificent stone docks which wall the banks of the Mersey for miles." P. 65.
354 Stratford-on-Avon, Eng. "The house in which Shakespeare was born." P. 66.
355 Shottery, Eng. "The cottage in which he courted Anne Hathaway." P. 66.
351 London. "That is the Bank of England, one of the most famous banks in the world." P. 71.
349 The Tower of London. "A gloomy building on the banks of the Thames." P. 73.
348 London Bridge. "The busiest of all the twenty bridges which cross the Thames in the city." P. 74.
352 London. "Let us go into the House of Peers." P. 81.
350 London. "We visit Westminster Abbey near by." P. 81.
431 Nice, France. "Watch the women washing at that stream outside the town." P. 92.
429 France. "We spend some days at Marseilles." P. 100.
421 Paris, France. "A vast network of cream-colored houses." P. 106.
422 Champs Elysees, Paris. "We leave our carriage and walk down the avenue." P. 111.
424 Paris, France. "Our eyes catch the roof of the Opera House, another magnificent structure." P. 112.
423 Paris, France. "We stop at the flower market." P. 120.
425 Paris, France. "Later on visit Notre Dame." P. 120.
397 Namur. "We have left France and are traveling through Belgium." P. 125.

395 Brussels, Belgium. "Its people can raise nearly all their own food." P. 127.
399 Holland. "In many Dutch cities the canals form the principal streets." P. 138.
403 Holland. "Notice how careful they are of the cattle." P. 140.
402 Holland. "Did you ever see such shoes?" P. 142.
400 Rotterdam. "Ship canals . . . so that big vessels come into the cities to load and unload." P. 145.
401 Holland. "What a lot of towns and villages there are scattered over the country." P. 147.
406 Copenhagen, Denmark. "How clean the streets are!" P. 158.
404 Copenhagen, Denmark. "The buildings are chiefly of stone or light-colored brick with tiled roofs." P. 159.
405 Copenhagen, Denmark. "We visit the Thorwaldsen Museum." P. 160.
407 Norway. "The noise is made by that great volume of water dashing down into the fjord." P. 165.
413 Lapland. "They milk the reindeer just as we milk our cows." P. 170.
415 Spitzenbergen, Lapland. "Many ships are engaged in catching them for their oil and whalebone." P. 173.
414 Lapland. "We look at our watches, and lo! it is midnight." P. 175.
412 Norway. "Ground into pulp to make printing paper." P. 178.
408 Norway. "Racks of wood or wire at the sides of the fields." P. 179.
410 Norway. "It is of the kind known as 'flat-brod' which is used all over Norway." P. 179.
409 Telemarken, Norway. "The women and girls make all the clothes of the family." P. 180.
420 Goteborg, Sweden. "Its canal streets filled with shipping." P. 181.
416 Stockholm, Sweden. "We cross at least two bridges every half mile." P. 182.
417 Stockholm, Sweden. "This is the palace of the King of Sweden." P. 184.
419 Sweden. "We see . . . many women and children at work in the fields." P. 185.
386 Hamburg, Germany. "The chief outlet for Germany in its commerce by sea with the rest of the world." P. 195.
393 Cologne, Germany. "Early one morning we go to the market." P. 214.
385 Berlin. "We often see regiments of infantry and cavalry in the streets." P. 216.
383 Berlin. "We visit the Reichstag building." P. 217.
384 Berlin. "We go with our guide to the great palace of the emperor." P. 218.
388 Bavaria. "In some fields there are more women than men." P. 224.

390 Rudesheim, Germany. "We see vineyards everywhere, as we steam on up the river." P. 240.
391 Germany. "Fair Bingen on the Rhine." P. 243.
389 Germany. "Strassburg is especially noted for its cathedral and the great clock within it." P. 247.
444 Switzerland. "There are silvery cascades, emerald meadows, and level uplands spotted with flowers." P. 251.
448 Switzerland. "There are hotels everywhere." P. 252.
441 Switzerland. "Much of the way is over dangerous paths." P. 254.
446 Switzerland. "The views are indescribable." P. 254.
427 France. "The best place to see them is in the valley of Chamouni." P. 256.
428 France. "We are now in the midst of a wide, turbulent ice river." P. 256.
440 Switzerland. "Go up the Rigi and other mountains by cog railroads." P. 259.
443 Switzerland. "Carving things out of wood." P. 262.
447 Switzerland. "He makes butter and cheese, sending some from time to time to the village." P. 266.
445 Switzerland. "Almost all the houses are of wood, but they are comfortable, and many are very picturesque." P. 266.
387 Germany. "We first go to Nuremberg." P. 273.
460 Innsbruck, Austria-Hungary. "The Alps extend . . . on into Austria, being then known as the Tyrol." P. 275.
463 Austria-Hungary. "We walk through the Graben, one of the oldest streets of Vienna." P. 290.
464 Budapest, Hungary. "We take a drive through the wide Andrassy Road." P. 299.
467 Serbia. "At the junction of the Save and the Danube." P. 305.
470 Roumania. "The Danube flows on and on." P. 308.
468 Sofia, Bulgaria. "The people . . . seem to be more prosperous and more enterprising." P. 309.
471 Roumania. "The Roumanians especially are a fine-looking race." P. 309.
469 Bulgaria. "We end our journey on the Danube at Ruschuk." P. 309.
488 Russian peasant. "The Russians are largely a nation of farmers." P. 320.
482 Petrograd, Russia. "We again cross the Neva to visit the palaces and government departments." P. 338.
481 Russia. "We make excursions north into Finland." P. 339.
485 Russia (Poland). "Another trip takes us to Warsaw." P. 339.
483 Moscow. "In the very center of the city is a great fortress or citadel known as the Kremlin." P. 347.
484 Russia. "At Nizhni Novgorod, on the River Volga." P. 351.
489 "The Strait of the Bosporus . . . winds in and out through a deep mountain valley." P. 361.
472 Constantinople. "Let us walk over the bridge." P. 368.
473 Constantinople. "We pass peddlers and hucksters." P. 368.

474 Constantinople. "We . . . are making our way through the city." P. 368.
475 Athens "has many magnificent buildings of the purest white marble, and thousands of two, three, and four-story houses of brick covered with stucco." P. 384.
476 Athens. "There are palaces with gardens about them." P. 384.
477, 478 Olympia, Greece. "We learn that scholars come here from all parts of the world to study the ruins of old Greece." P. 390.
479 Greece. "Nearly all the farming is of the rudest description." P. 391.
457 Venice, Italy. "You can step from your house right into your boat." P. 394.
458 The Milan Cathedral "is a great Gothic structure, made of the purest white marble." P. 408.
456 Florence. "We stroll along the River Arno, which flows through the town." P. 410.
459 Lake Como. "The scenery is very beautiful." P. 410.
450 Rome. "A bird's-eye view of the city." P. 412.
451 Rome. "That mass of huge buildings, with the high dome above them, . . . is Saint Peter's Cathedral, and the palace of the Vatican, where the Pope lives." P. 412.
452 Rome. "All that is left of the Coliseum, the greatest show ground of all times." P. 413.
453 Naples. "The most interesting thing about Naples . . . is the great volcano outside." P. 421.
433 Spain. "We have crossed the Mediterranean . . . to Barcelona." P. 428.
437 Spain. "How our train flies by orange groves." P. 429.
438 Spain. "The roads are poor." P. 429.
435 Madrid "is situated almost in the center of the plateau, with dreary plains reaching out for miles on every side." P. 437.
436 Granada, Spain. "We explore the ruins of the Alhambra." P. 443.
439 Gibraltar. "The enormous bare rock commanding the strait." P. 444.

4. Asia

534 Japan. "The cherry tree is cultivated for its blossoms." P. 24.
525 Fuji-Yama, Japan. "A white mountain cone which hangs like a silver cloud on the western horizon." P. 25.
526 Tokyo, Japan. "With the Japanese capital spread out before us." P. 36.
535 Japan. "Did you ever see anything more beautiful?" P. 37.
532 Japan. "There are crowds at the shops buying goods." P. 43.
534 Japan. "The Japanese mother often goes about with the baby tied to her back." P. 50.
531 Japan. "Have fish cooked in all sorts of ways." P. 55.
533 Japan. "We have been wondering where we should sleep." P. 56.
528 Rice fields, Japan. "And set out the young sprouts in the mud." P. 83.

529 Rice fields, Japan. "The straw is then cut off close to the ground with a sickle." P. 83.
527 Rice fields, Japan. "We find rice fields in all the lowlands." P. 84.
536 Japan. "Another interesting occupation . . . is the rearing of silkworms." P. 86.
539 Japan. "The cocoons." P. 86.
538 Japan. "The worms . . . fed upon mulberry leaves." P. 86.
540 Japan. "Raw silk reeled from them." P. 86.
537 Japan. "The country has many mulberry orchards." P. 86.
541 Japan. "They now have also the finest of modern silk mills run by electricity." P. 87.
523 Manchuria. "Boards sawed out by hand as they are needed." P. 91.
542 Chosen. "Trotting along with a cartload of pottery tied to his back." P. 95.
543 Chosen. "Korean porters . . . still carry much of the freight." P. 96.
517 China. "The Yangtze . . . navigable for steam vessels for one thousand miles from its mouth." P. 111.
515 China. "Railroads can be easily built." P. 112.
519 China. "Swarming with yellow-skinned people." P. 115.
518 China. "Vast quantities of goods are still carried across country upon wheelbarrows." P. 118.
516 Nanking, China. "The people are beginning to want modern roads." P. 120.
521 Chifu, China. "Suppose we enter a store." P. 125.
520 China. "We find all sorts of schools in Peking." P. 133.
524 The Great Wall of China. "At last we reach the gate that leads through into Mongolia." P. 139.
514 Hongkong. "Millions of Chinese are born, live, and die upon the water." P. 155.
523 Manchuria. "Almost every kind of labor is still done by hand." P. 158.
522 China. "In North China the plowing is done also with ponies and donkeys." P. 159.
536 Silkworm incubator. "Within a few days the eggs hatch." P. 168.
538 Feeding silkworms. "As the worms grow older they are fed once an hour." P. 168.
539 Cocoons. "Enveloped in a tightly wrapped silk shell or cocoon." P. 169.
540 Reeling silk from cocoons. "The women and girls unwind the silk by means of rude machines." P. 169.
513 Hongkong. "We land and take a ride through the city." P. 180.
514 Hongkong. "There are hundreds of such boats in the harbor, upon which people live." P. 180.
510 Burma. "The girls are more free to talk with us than any others of their sex we have met with in Asia." P. 220.

502 Agra, India. The Taj Mahal. "Thought by travel most beautiful structure of the whole world." P.
503 Delhi, India. "We see temples and shrines almost P. 276.
501 Benares, India. "Tens of thousands of Hindus go to worship and bathe in the Ganges." P. 278.
504 Jalpur, India. "One of the most picturesque crowds beasts to be found in the world." P. 288.
505 Jaipur, India. "But look at the elephants!" P. 289
508 Northern India. "They are the highest of all mou 295.
494 Syria. "We must pay a tribute to the chiefs, or she their subjects from robbing us." P. 339.
472 Constantinople. "Who lives at Constantinople in I 348.
495 Palestine. "On the Mount of Olives outside Jerusale
496 Palestine. "Many Russian pilgrims on foot." P. 3
493 Syria. "Damascus is one of the oldest cities of the 360.
492 Syria. "The thriving Mediterranean port of Beirut."
497 Palestine. "Near each little town is a threshing floor the grain is trodden out by oxen or donkeys." P.
544 Siberia. "We are traveling this morning on the g Siberian Railroad." P. 373.

5. Africa

25 New York. "Out through the harbor of New York, Island, and on into the Atlantic." P. 9.
439 Spain. "In Gibraltar Bay under the frowning guns."
556 Algiers. "The harbor is full of vessels." P. 40.
557 Tunis. "The city proper is almost surrounded by wa
564 The Nile, Egypt. "The water is now conducted

560 Cairo. "We cross the Nile over a magnificent iron bridge guarded by bronze lions." P. 103.
561 Egypt. "The Great Pyramid was once four hundred and eighty-two feet high." P. 104.
565 Egypt. "No one knows just how old the Sphinx is nor why it was made." P. 106.
567 Thebes, Egypt. "There are also huge statues." P. 107.
568 Egypt. "Wonderful ruins . . . at Karnak in Upper Egypt, including the remains of temples." P. 107.
559 Suez Canal. "We take passage . . . for Suez, and are soon steaming along through the desert." P. 112.
572 Native market, Victoria Nyanza. "The natives are strange in the extreme." P. 136.
570 Uganda. "The cloth comes from a stately tree with small green leaves." P. 142.
572 Native market. "The tusks are a valuable article of commerce." P. 152.
577 Rhodesia. "We meet some English hunters who have killed a hippopotamus." P. 182.
572 Port Florence, Victoria Nyanza. "Suppose we visit a market and see how the Africans do business at home." P. 243.
574 Dar-es-Salaam. "A little farther down the coast on a beautiful bay." P. 255.
576 "The Victoria Falls are in many ways more wonderful than Niagara." P. 280.
575 "The Cape to Cairo Railroad . . . crosses the Zambesi on one of the highest bridges of the world." P. 280.
581 Kimberly, S. A. "A guide . . . takes us down into the works and shows us how diamonds are mined." P. 299.
579 Johannesburg, S. A. Gold quartz mine. "Much of the rough work is done by Kaffirs, superintended by white men." P. 309.
582 Capetown. "Table Mountain . . . rises behind the town in a sheer precipice." P. 318.
580 Crossing the Vaal, S. A. "Huge wagons with long teams of oxen." P. 322.

6. Australia, Our Colonies, and Other Islands of the Sea

585 Sydney, Australia. "Sydney has several thousand acres of parks devoted to public amusements." P. 23.
586 Melbourne "is a fine city almost as big as Boston." P. 43.
587 Melbourne. "Magnificent buildings of gray stone." P. 43.
588 Kangaroos. "We see specimens of every kind in the zoölogical gardens." P. 47.
589 Range cattle. "Queensland . . . has rich farms and pasture fields not far from the coast." P. 53.
584 South Africa. "We see winged penguins." P. 68.
590 Tasmania. "We are in Hobart . . . in the Switzerland of Australia." P. 69.

City, where most of the officials have their of
549 Philippine Islands. The carabos "are strong, a harrow the muddy rice fields, where a hors sink through." Pp. 169, 179.
550 Philippine Islands. Hulling rice. "After this be pounded off with hard wooden pestles in a a block of tough wood." P. 181.
548 Philippine Islands. Mayon Volcano, "one of th mountains of the Philippines." P. 192.
553 Philippine Islands. Hemp "is made into all sort clotheslines to cables." P. 194.
552 Philippine Islands. "The hemp plant looks just plant." "The hemp comes from the white inr 195.
512 Ceylon. "We pass Kling women . . . blazing How the gems are ground. P. 261.
511 Ceylon. "In the harbor of Colombo surrounded all parts of the world." P. 264.
455 Palermo. "We spend some time in wandering abo
300 Martinique, F. W. I. "It periodically bursts fo eruptions." P. 327.
257 Porto Rico. "We find ourselves in front of San
302 Guadeloupe, F. W. I. Coffee pickers at work. P.
295 Havana docks. "Porto Rico raises some of the the world." P. 338.
258 Porto Rico. "In the great belt of sugar cane wh circles Porto Rico." P. 342.
301 Jamaica. "The island has great natural resources
299 Santiago, Cuba. "A city of white buildings, witl tiles." P. 362.
298 Cuba. "There the same work is done by oxen."
297 "The stalks are now

48. SOME THINGS WE EAT; SOME THINGS WE WEAR

By WILLIAM M. GREGORY

PROFESSOR OF GEOGRAPHY, SCHOOL OF EDUCATION, CLEVELAND, OHIO

This selection of views from the Keystone "600 Set" has been made to supply teachers with dynamic material for the use of elementary pupils. Every modern course of study includes progressive plans for the teaching of the basal facts relating to our food and clothing. It is the aim of this collection of views to make real and vivid these elementary ideas of life. To give your pupils a live keen interest in these common needs of life, the views have been grouped under the two headings of "Some Things We Eat" and "Some Things We Wear."

Let all teachers fully realize that mere word or definition teaching is useless. Schools are to supply children with ideas and ideals; these to be useful must be based upon facts that are gathered by the pupils. It is the business of the modern school to supply the materials for observation. We must have stereographs, specimens, excursions, word pictures and many other devices.

In the study of our food and clothing, it is very necessary that children fully realize the actual conditions under which we live and how we are almost wholly dependent upon many different people to supply our many needs. It is impossible to take pupils to all the countries where foods are grown or clothing is made. Likewise there is a limit to the actual specimens that can be wisely used in a classroom and the raw materials give to children no impressions of the producing countries — hence, the great value of this series of stereoscopic views that makes each pupil feel as if he were in the scene pictured. *The stereograph requires and stimulates real observation by the pupil. It arouses his interest and gives real ideas that form a definite background for clear concepts.*

green and solid when picked. They can be shippe
tance and they turn a beautiful golden yellow if k
cool place until ripe.

236 Tokay grapes. Some of these California grapes are
for use as fresh fruit. Most of the grapes, howev
into wines and raisins. The grapes are laid on
hot sunshine and in a few days they have shrive
are soon packed into boxes and shipped to various
country.

·47 Fine muskmelons. This fruit is common in our ga
muskmelons grow in nearly all parts of the United
cantaloupe is a species of muskmelon.

437 Oranges in Spain. All of the orange trees of the U
have been grown from sprouts and seeds that came
We do not import into this country any large numbe
from Spain; for our California and Florida oranges
and cheaper.

238 Orange fruit and blossoms. Here is a cluster of bea
blossoms with the golden fruit ready to pick.

237 Orange grove. We are looking at a grove of more
orange trees in California. These orange trees are
lands, which means that the trees live upon wa
brought to them in small ditches.

85 Peaches. We cannot eat all this fruit when it is rip
soon spoil. Some of the peaches mother will put i
at home and then in the winter we will have peach
and pies. Many of the peaches are canned in tin c
factories.

108 The pineapple grows only in warm climates. It gr
Florida, California and the Hawaiian Islands.
carefully gathered, packed and placed on a fast
and soon reaches our home where it is mainly used

it would be almost impossible to harvest our great corn crop. Corn is used as a food in several different ways such as corn meal mush, corn bread, corn cakes, toasted corn flakes, etc.

357 Harvesting wheat. Because the farmer uses the binder and other improved machinery our bread is cheap. Wheat flour is also used for making pies, cakes, crackers, etc. Graham crackers are made from unbolted wheat flour.

Milk

57 Milking the cows. The nice rich milk that all children love to drink and to eat with their porridge comes from the dairy cow. This is a fine dairy in which everything is kept very clean and sweet.

46 Bottling pure milk for the children in the city. After milking the cows, the milk is taken to a large room where it is carefully strained of all impurities and then it is sometimes pasteurized. This means that it is slowly heated to a certain temperature and cooled. This renders the milk less liable to spoil or to sour. Nearly all cities require milk to be placed in clean bottles which are sealed at the dairy.

411 Milking goats in Norway. You remember the story of Heidi where the goat supplied her people with milk and cheese and it is the same in the country of Norway where the people depend upon the goat to furnish them milk.

413 Laplanders milking reindeer in Norway.

396 Dog cart for peddling milk in Belgium. In the place of peddling the milk in bottles, the Belgians have a dog draw the cart holding the milkcan to the customer's door, and there they measure out the milk with the little measuring cup on the front of the cart.

487 The girls are selling jars of fresh milk in Russia. It looks like a heavy load. It would seem that the milk in these open jars would gather dirt and other impurities.

339 Selling milk unadulterated in a hot country.

Bread and Butter

Wheat

199 Wheat is our staff of life or our most important food. No meal is complete without bread. Wheat bread is the most common in the United States. In the prairie plains a single farm may have a thousand acres in a great field of wheat.

177 Threshing wheat. This machine cleans the grain of its chaff and straw and then we say that the grain has been threshed. The grain is next taken to the railroad station and shipped to the great mills which grind it into flour. Minneapolis on the Mississippi River in Minnesota has the largest flour mills in the world.

498 Grinding wheat in the oldest kind of a mill. They seldom grind more than enough flour for one day. The flour made in this

ried through the streets on the back of a donkey. with one of our large city bakeries.

Corn

184 Corn field. Observe how high this corn grows. Co world's greatest crop and is used for food in many ways.

292 Making corn tortilla. The tortilla (tor-te'lya) is the kinc that is eaten by many children in Mexico and South A

Barley

566 A barley field in Egypt.

410 A curious kind of bread. This is the Norwegian bread been made of water and barley flour rolled very thin a on a hot stove. Sometimes they make enough of this last several months.

Some Drinks for All the Family

Chocolate and Cocoa

303 This is the chocolate or cacao tree. The seeds are tak the pods and carefully dried. They are packed in shipped to England, Holland and the United State they are ground very fine and made into chocolate a A very fine drink for children.

Coffee

302 Picking the red cherry-like coffee berries. This tree is in the shade of a banana plant. The berries that th picks are put into a little sack that she carries.

310 Coffee drying in Brazil. Each berry looks like a fine cherry and at the coffee house, usually near the cent

Tea

530 Tea is from the tender leaves of bushes that are cultivated in large plantations in Japan, China and India. This girl is protected from the hot sun by a very cool and comfortable rice straw hat. When she has picked a basket full, it is taken to a tea house at the edge of the plantation and carefully treated to give it a fine flavor. The tea is packed in boxes and sent to some of the cities which ship the tea to our country.

521 This is a large Chinese tea store. Some tea is made from the tender little buds of the tea plant and it is flavored with orange blossoms. This tea is highly prized and is served by the Chinese only at a Wedding.

534 Tea house. In many places in the far away country of Japan they have little buildings like this one for travelers to stop at and drink a cup of tea.

373 Drinking tea in Scotland. Tea is a drink very refreshing for grown people and I trust that you often play tea-party but never drink the strong tea. Milk is the best drink for children.

Sugar

198 A sugar beet field in Colorado. Much of our sugar comes from fields like these in Colorado, California and Michigan.

419 Sugar beets in Sweden. Many other countries besides our own raise sugar beets. In all of the sugar beet fields you will find many boys and girls working with their fathers and mothers; for many people are required to keep the weeds out of the sugar beets.

270 A pile of sugar beets that will make two thousand barrels of sugar. In no country in the world do the people eat as much sugar as we do. What feasts we have with pies, cake and candy!

271 Stream of juice made from sugar beets. Now the water will be separated from this juice and the fine white sugar obtained.

35 Sugar is packed in barrels and bags. Granulated sugar is made from either sugar cane or sugar beets.

34 Making loaf sugar. When this loaf sugar is dried, it is carried on this moving belt we see to a part of the factory where it is packed into boxes and shipped to the stores.

258 Cutting sugar cane. In warm countries like Louisiana, Cuba, and the Hawaiian Islands, sugar is obtained from the sugar cane. This is planted and harvested much like corn. The stalks of the sugar cane are crushed in the mill and the sweet juice makes the coarse brown or the white sugar. Granulated sugar is made from either sugar cane or sugar beets.

130 Tapping a maple sugar tree. The sap of the maple tree is used to make the delicious maple syrup and sugar.

Meats

Beef

185 Fat cattle for beef. They are ready to be shipped in cattle cars across the country to some of the cities in which are great slaughter and packing houses.

140 This is a great stock market in Chicago, the largest in the world. The cattle are unloaded into these yards or pens and the buyers look them over very carefully. The finest and fattest are bought and taken to the great slaughter houses that are nearby. In Chicago as many as 5,000 cattle may be made into beef in a single day.

141 The last process in dressing beef. The packing house is very clean and neat. Every part of the animal is used, the meat for food, the bones for combs, the hair for plaster, the hide for leather, the hoofs for glue and many other useful things. Most of the meat that we buy at the butcher shop was shipped to us in refrigerator cars.

Pork

183 The meat of the pig makes pork. It comes to our homes either fresh, as pork chops and sausage, or salted and smoked, as hams and bacon.

142 Cutting up pigs. All parts of the hog are used, the bristles for brushes, the hide for gloves, the bones for knife handles, the fat for lard, the hams and bacon for smoked meat. Each day a whole train of refrigerator meat cars leaves Chicago and goes to the great eastern cities to supply them with meat.

143 Trimming and skinning hams before pickling.

144 Making link sausage of pork.

Mutton

173 Sheep come to our tables as lamb or mutton. These meats are considered more delicate than either beef or pork but not so strengthening.

180 In the mountain valleys of Idaho and other Western states are great flocks of sheep, sometimes containing thousands of animals. In the fall they are shipped to the packing houses in Omaha, Kansas City or Chicago.

480 Sheep are raised in all parts of the world and their meat is valued everywhere.

Fowls

56 Chickens. In every continent chickens are raised for eggs and meat. Of course the chickens that are carefully cared for are better for both purposes.

190 Pigeons, especially squabs as the young are called, are a great delicacy. They are especially good for invalids. You will see chickens among the pigeons and in the background.

338 The boy in the foreground is carrying a pet chicken in his arms.

It is very probably a game chicken, highly prized among all Latin Americans.

216 Geese also are raised for their eggs and meat. The eggs are large in size. The grease or fat is fried out and used in cooking in place of lard. Goose feathers, too, are very valuable.

Game

2, 189 Men are very fond of game, as the flesh of wild birds and animals is called. Game must be hunted and state laws allow wild animals to be killed only at certain times of year.

Fish and Oysters

226 Fine fresh salmon just caught. This fish has a firm pink flesh and it is considered one of our finest.

227 Chinese preparing salmon for canning. The fish are cut into slices that just fit a can and after the can is filled it is put into boiling water or steam chests which cooks the fish. The cans are carefully sealed and shipped to all parts of the world.

244 The salmon being dried by Indians. The dried fish is stored away for use in the long cold winter.

13 Drying codfish. The cod is caught in the ocean waters from Massachusetts north to Greenland. It is a fine fish to eat when fresh from the water. The codfish is also salted and dried in large quantities. The dry fish are packed into boxes and shipped to all parts of the world.

531 Drying sardines. In Japan very small fish are caught in nets and dried in the sun. These little fish are boiled in oil and packed in little cans and sold as sardines.

86 The oyster is an animal that lives in a two part shell in the ocean. Along our Atlantic coast and in the Chesapeake Bay are many oyster beds. They are scooped up from the bottom of the ocean. The oyster boat carries them to a market where they are sold to a packing company. These women are employed by the company to remove the shells from the oysters before they are packed and shipped.

Salt

42 Making salt. How flat our food tastes without salt! The men are collecting the white salt that has been made from salt water or brine. The salt brine is pumped to the surface through pipes that go deep into the earth.

153 Packing salt into barrels. The salt is stored in sheds and looks like great piles of snow. It is ground fine and shoveled into barrels to be shipped to the grocery stores.

Vegetables

83 Children learning how to grow vegetables.

166 Potatoes are almost as necessary to us as wheat. They are dug by the machines drawn by the horses. The men are picking up the

105 Growing rice in the United States. Rice is bei
a vegetable. One pound of rice is said to
nourishment as four pounds of potatoes. In t
of the United States we grow rice but only
what we use. Most of the rice we eat co
India and China.

528 Planting rice in Japan. Rice is the food of ne
people of the world.

527 Rice fields in Japan. Most of the rice we use is
fields in Japan. India and China also grow
the rice fields are small and flooded with wa
see.

550 Preparing rice for food in the old way. In t
send the rice to a mill where the grains are
This destroys much of the food value.

Pudding, Pies and Nuts

529 Most of the rice we use in pudding and in vario
is grown in Japan. Rice grows to about the s
our wheat.

137 We all like pumpkin pie. There are many wagon
ing yellow pumpkins in this field. I would lik
large one nearest us for a Jack-o'-lantern and I c
other for making pies.

175 Apple pie is our most common pie.

85 Peach pie is a treat and in this peach orchard are
loaded with the luscious fruit. This man may b
for pies or peaches and cream.

234 Almonds are easy to crack and the meats are
nuts grow in California, Texas, etc. When the
a canvas is spread on the ground and long
knock off the nuts

II. SOME THINGS WE WEAR

Some Queer Clothing

204, 98, 158, 168 Indian Costumes.
490 Skins used for coats, hats and shoes.
246 Warm fur caps and coats in Alaska.
328 These Indians of southern South America wrap the skins of animals about themselves in the same way as we use blankets.
343 Eskimos wearing leg moccasins of fine furs.
290 Big straw hats, decorated coats, and colored scarfs.
402 Dutch children wearing wooden shoes and queer caps.
465 The girls wear shawls for hats and the boys wear decorated trousers.
519 The padded coats of the Chinese are warm.
592 Savage people of warm climates wear little clothing.
572 Native Africans wear little clothing.
570 The man peeling the bark from the tree is wearing cloth made out of bark.

Cotton

117 Picking cotton, the most widely used of any fiber. The cotton is picked from September to Christmas. Many colored people help to pick the fluffy balls of cotton.
124 The cotton is hauled to the gin. After the cotton is picked the seeds must be separated from the fiber. The small seeds contain oil which is pressed out and sold for cooking and many other purposes.
125 The cotton gin was invented in this country for it was very slow work to separate the seeds and fibers by hand. The white fibers are packed into bales each weighing about 500 pounds, and then are ready to be shipped to the cotton mills.
119 The 500 pound cotton bales on the docks. New Orleans is a city on the Mississippi River that buys much of the cotton from the plantations. The cotton is then shipped all over the world.
286 Carding room, cotton mills, Arizaba, Mexico.
14 Spinning cotton yarn. When the bales of cotton reach the mill, the cotton is cleaned, combed and spun into yarn. The cotton yarn is twisted into a hard thread and wound on the hundreds of spools or spindles which are seen in this room.
16 Printing the design on the cotton cloth. Cotton cloth is made plain white or it may be printed in many designs of checks, bars, flowers, etc.

Linen

268 Preparing flax for making linen. The flax plant grows like wheat. From the straw is obtained these fine white fibers. The fibers are spun into thread which is wound from the large skeins upon small spindles for weaving.
269 Weaving linen cloth. The threads from the many spindles are

garments.

145 Shearing sheep with power driven shears.

17 Sorting wool after cleaning and washing.

18 Spinning yarn in a woolen mill. The woolen fibe twisted and pulled together into thread and yarn. chines are busy preparing the yarn and thread for cloth on the noisy looms.

409 Spinning woolen yarn. The woman at the right is wool and filling the basket with it. The woman ning wheel is twisting and drawing the wool into can be made from the yarn in the balls?

506 These people show us how cloth is made from wool is made by the person at the small wheel. This y on the loom where it is woven into cloth. This w ing cloth is much more simple than in the great fa are filled with noisy machines.

Silk

536 Silkworm incubator in Japan. In Japan the peopl silkworm so that they may have the fine fiber th The worms are hatched from very small eggs.

537 Gathering mulberry leaves for the silkworms.

538 The young girl keeps the silkworms supplied with so that they will grow rapidly.

539 The cocoons or nests. The worm makes a silken weaves it into a small soft nest. The cocoons a and the worms killed by being exposed to the sun or heated air.

540 The silk thread is unwound from the cocoon and the then ready to go to the factory.

541 One of Japan's largest silk weaving plants.

22 Sorting and weighing the skeins of raw silk in

Shoes

272 Making leather out of the hides of animals.

11 Cutting leather into the required shapes for shoes. Years ago our shoes were made by one man called a cobbler. In a modern factory all of the parts for thousands of shoes are cut out.

41 Sewing together the parts of a shoe. The sewing is done on machines run by electricity and operated by many young ladies who are very skillful.

12 A machine that shapes the shoe. So many machines are used and the men are so skillful that more than 10,000 pairs of shoes are made in a single day in some of the great shoe factories in Lynn or Brockton in Massachusetts.

532 A Japanese shoe shop. These people wear quite a different shoe from ours. It is made of a wooden board and fastened to the foot by a heavy rope of rice straw. Some of these Japanese clogs, as they call their shoes, have an upper part of cloth or rice straw. These shoes sell for from five to ten cents per pair.

Rubber Boots

247 The wonderful rubber tree. The milk or sap of the tree flows from the cuts and it is from this sap that our rubber is made.

131 Crude rubber gathered from many countries. Name five different articles made from rubber.

133 Making rubber boots. The rubber is heated, colored and rolled out into sheets. In this large room the rubber boot is put together. When we wear our next pair of rubbers let us try to imagine a story of their travels.

75 Rubber boots are needed by these miners.

227 Chinese wearing rubber boots to keep feet dry.

Jewelry and Fine Ornaments

21 Making fine jewelry. This factory is in Rhode Island and the gold and precious stones used here come from many parts of the world.

512 Grinding gems, garnets, rubies, etc., Ceylon.

581 Mining diamonds in South Africa. They are found in this clay.

245 Gold is sometimes found in the sand of creeks.

579 Gold mining in Africa.

334 Refining silver in smelter, Peru, S. A.

573 Ivory ready for shipping. Ivory is used in many ways for ornaments. (See 509 for elephants.)

NOTE: The Keystone View Company's C
presents a list of many thousands of stereogra
slides. Especial emphasis is placed on the
dealing with our great industries. There is als
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alog is sent free upon request.

THE

49. HOME GEOGRAPHY

By R. H. WHITBECK, A.B.
PROFESSOR OF GEOGRAPHY, UNIVERSITY OF WISCONSIN. EDITOR "JOURNAL OF GEOGRAPHY"

Home geography is the study of the region surrounding the home. It is based upon first hand observation by the pupils. If the study is carried no farther than the observation of the home region, the full purpose of home geography will not be achieved. In America, home geography means the study of various types of things which belong to geography and which are observable in the home region. By means of directed observation of the things which are around the pupils, certain fundamental concepts are built up; for example — the purpose of a home, the need of home industries for supplying our wants, the purpose of clothing and how the materials for clothes are obtained; and an understanding of simple industries; trade, travel, and transportations. Nearly every pupil is able to observe some of these fundamental things in his home environment, thus obtaining the vivid concepts which only observation can produce.

But the pupil will find less interest in this study and will see less purpose in it, if his studies do not reach out to things beyond his home, but which are closely related to things observable at home. It is here that the photograph plays a highly important part. Manifestly pupils cannot obtain correct notions of homes in general by observing simply the kind of homes in which they or their neighbors live; but by means of the stereograph they may be introduced to homes in many parts of the world and may thus obtain not simply special concepts but general concepts. By means of the stereograph pupils may see homes in the Frigid Zone, in the Temperate Zone, in the desert, in the hot countries, in city, village, and country.

The stereograph becomes an invaluable supplement to the textbook, for nothing except seeing the actual thing is more

mental notions belonging to home geograph
stances permit, home geography includes the
weathering, soil, stream erosion, and depositio
servation of as many kinds of land forms and
home region supplies. It is in fact a study of th
environment, not only for itself but also as a
preciating many geographical facts which are n
servable.

In harmony with the needs of presenting Hor
to the younger pupils, only a limited selection of
scenes has been made. For a more extended sel
graphical scenes see the group of classifications a
der the heading of Geography.

I. TYPES OF HOMES

A. SIMPLE HOMES

359 Home of the nightingale. Consider kinds of home
and animals. Why do they have homes?

205 Ruined homes of the cliff dwellers. Consider wh
built their homes in such places. Compare with
rope.

281 A lowly home in Old Mexico. What is abode and

546 Floating homes in the Philippine Islands. Could t
our climate?

373 A Scotch Highland home. Of what is it made?

445 A home in the Swiss Mountains. How does it c
Highlander's house in view 373?

533 The neat and simple interi[illegible]

B. HISTORIC HOMES

355 Anne Hathaway's cottage in England. Why should this cottage be preserved so many years?

354 Birthplace of William Shakespeare in England. Who was William Shakespeare?

362 Home of the poet, Wordsworth, in England. Read Wordsworth's beautiful poem, "The Daffodils."

372 Birthplace of Robert Burns in Scotland. Do you know anything about Robert Burns?

9 Longfellow's home in Cambridge, Massachusetts. Do you know any poem written by Longfellow?

113 Log cabin in which Abraham Lincoln was born. This cabin is now enclosed by a larger building which protects it. Why is such a poor cabin so carefully preserved?

96 Washington's home at Mount Vernon, Virginia. Compare this with Lincoln's home in the previous scene. For a more complete list of homes see classification Children of the World including Home Life.

II. THE CITY HOME

Starting from his own home, its materials, life etc., the child will see homes centered about mills, factories, stores, banks and offices. He will see the materials for work and living brought in and will trace them to their sources, at the same time showing what the city does in return.

A. KINDS OF HOMES IN CITIES

90, 93, 121, 212, 220 Here we have general views of cities where land is very valuable and people live crowded together.

455 There are tenement homes in all the large cities of the world. This picture could very well have been taken in New York or Chicago or any of our large cities.

9, 10, 37 Farther out from the business parts of a city are homes with yards and even gardens. Here are the pleasantest places to live.

83 City people often can have little gardens which are both pleasant and profitable.

B. BUILDING MATERIALS

1. Wood

9, 10, 147, 236 These homes are made of wood brought from the forests. Usually there are city ordinances forbidding the use of wood as a building material in the crowded parts of the city. Why?

224 Cutting a great tree in an Oregon forest.

2. Stone

3, 4, 45, 37 Stone is a splendid building material t
tically forever. Stone must be taken out of
usually is expensive.

3. Brick

121, 212 Very many of our homes are made of bri
durable than wood and less expensive than ston

C. STREETS

6, 8, 31, 266, 273, 331, 340, 464, 474 Consider reasons for
street sweepers, broad sidewalks, street cars, an
not so necessary in a village or in the country?

7, 31, 139, 230, 273, 315, 373, 380, 473, 587 Street cars, ele
and automobiles make it possible for people who
cities to live out where it is cleaner, healthier,
and where they can have yards and gardens.

D. FOOD

People who live in the city depend absolutely upon th
their food.

57, 46, 159, 165, 339, 396, 403, 411, 413, 487 Milk is one of
portant of foods and milk must be brought fro
Notice the different methods of caring for milk.

45 Butter too must come from the country and should
the most sanitary conditions.

56 Eggs and chickens are of the highest importance a
are shipped to the cities by millions.

127, 159, 172, 183, 185, 186, 190, 301, 480, 589 No city prod
meat. All the city can do is to prepare it for u
cold storage.

166 The potato is a staple article of food.

136, 146, 147, 177, 199, 218, 357, 408 The grain fields furnish the bread, our staff of life. Oat meal and corn meal are used almost universally and every baker's shop sells rye bread as well as wheat bread.

104, 105, 527, 528, 529, 549 Rice has much the same food value as the potato and can readily be used instead. People like to eat what they are accustomed to eating; so people in American cities do not change easily to rice when wheat and potatoes are scarce. It is amusing to learn that people in Hong Kong or Yokohama are no better satisfied with our grains and potatoes when rice is scarce.

13, 86, 226, 227, 278, 481, 531 Cities are often well supplied with fresh fish and oysters from the rivers, lakes or seas.

34, 35, 130, 198, 258, 270, 271, 419, 332, 333 Sugar comes to us from refineries in cities but they must get their raw material from the farms.

E. CLOTHES

Almost all the clothes we wear, whether of cloth or leather, are city products; the textile mills and the tanneries get their raw material from the country.

1. Cotton

117 Picking cotton in Mississippi. From what part of the cotton plant is cotton obtained?

124 Hauling cotton to the cotton gin. What is a cotton gin?

119 Bales of cotton at the wharf in New Orleans. Why is the cotton baled?

14 A cotton mill in Mississippi. What is meant by spinning cotton?

2. Wool

480 A flock of sheep in Greece.

17 Sorting wool in a Massachusetts woolen mill.

18 Spinning wool in great factories.

81 What process follows spinning in making woolen cloth?

3. Linen

268 Preparing to make linen cloth.

269 Weaving linen. For what purpose is linen cloth preferred to cotton or wool?

4. Silk

537 Gathering mulberry leaves in Japan. What are the mulberry leaves used for?

538 Tending the silk worms in Japan.

539 Silk cocoons. What are the cocoons and how are they made?

540 Reeling silk from cocoons.

541 Weaving silk cloth in Japan.

532 A shoe shop in Japan. Contrast the Japanese shoes
For styles of dress see Classifications Costume Desi
and Clothing, and Children of the World.

F. HEAT AND LIGHT

74, 75, 76, 77, 78, 79 Most of the heat used in warming c
driving our machinery and melting our ores comes fr
78 Coke makes a very hot, even fire and is much used in
steel mills.
69, 70, 122, 123 Oil and gas for both light and heat are use
of our city homes. They are clean and save labor.
144, 445 Wood used to be the common fuel. Today it ma
sidered a luxury in the city home.
6, 31, 40, 43, 53, 84, 139, etc. Electricity is rapidly coming i
motor power and as light. Cars, machinery, automobi
tors and machinery of all kinds are run by electricity.
washing machines, irons and stoves lighten housework.

G. OCCUPATIONS

In the cities are diversified employments. It is a good
children to think of what work is done by fathers, brothers, s
friends; then work done by other people in their cities, ther
other cities. They will then be ready to understand local
commerce.

1. Manufacturing

11, 12, 41, 532 Shoe factories employ thousands of men an
As a rule each worker does only one thing — whi
the work monotonous with little to cause mental
ment.
14. 15. 16. 17. 18. 22. 23. 24. 81 The [illegible]

61, 62, 63 Large cities grow up where both iron ore and coal can be obtained for the manufacture of steel. Great numbers of foreigners gather into these mills to do the unskilled labor.

116 There are vast mines of both iron and coal in the south which are being developed very rapidly.

65, 66, 67 The wonderful machinery of the steel mills is run by skilled workers whose wages are very high. It takes a high class of men to do this work.

82, 150, 151, 152 The manufacture of engines and of machines of all kinds call for skilled labor which is always high priced. Detroit has had a wonderful growth since it became the center of automobile manufacture.

131, 132, 133 Akron, Ohio, is the center of the rubber manufacture in the United States.

134, 135 Glass factories are not very numerous in the United States. Glass-making demands skilled laborers.

140, 141, 142, 143, 144, 145 Chicago, Kansas City, Omaha and other cities have immense packing houses where meat for the world is prepared.

187, 203 Cities also grow in our mining districts, for ores must be reduced.

2. Transportation and Commerce

Food and raw materials must be brought to the cities for use or for further distribution and manufactured products must be sent out. If our means of transportation were to stop operation for only a few days, there would be nation-wide suffering and destruction. City people would starve, people would freeze, mills would stop, stores close, vegetables and fruit would spoil. We can not count the ruin.

25, 26, 52, 106, 119, 217, 264, 267, 280, 295, 304, 314, 338, 347, 374, 386, 391, 392, 400, 443, 559 Do you live in a seacoast city with a good harbor? To such cities come ships bringing the products of other lands and carrying back what you have to sell. The good harbor fixed the location of your city.

61, 119, 128, 157, 164, 170, 174, 264, 267 Is your city on a navigable river? Transportation by water is cheaper than by land.

48, 158, 174, 248, 250, 252, 253, 399, 405, 457, 462, 559 To facilitate commerce canals have been constructed and these cause the growth of great cities such as Buffalo.

31, 41, 43, 61, 79, 82, 129, 128, 148, 157, 174, 223, 251, 253, 277, 323, 330, 440, 470 What railroads enter your city? Is it what you call a railroad center? Railroads carry food, manufactures, coal, oil, light, in fact everything to market. Conductors, engineers, brakemen, switchmen, firemen and a great army of other employees keep our railroads going and most of these men live in cities. So important are the railroads that the United States government regulates the conduct of those passing through more than one state.

31, 145, 273 The elevated railroad and the interurban trolley car with

people are not highly paid. Some states have made lating hours and fixing minimum wages.

8, 25, 30, 61, 121, 126, 139, 152, 167, 212, 213, 220 Every cities of the country, are offices where the business is carried on. There are thousands of superintendent treasurers, bookkeepers, clerks, stenographers, office tors, etc., all busily working that the world's industri tinue.

29, 351 Other men in banks are carrying on the financia of the world.

30 Newspapers have a regular army of people engaged of disseminating current history.

28, 87, 88, 89, 92, 94, 95, 99, 315, 352, 383, 417, 482 Cou people are busy carrying on the work of the govern

H. GOVERNMENT

All these things must be regulated by the government i people will not infringe upon each other's rights and that t the greatest freedom and safety for all.

7, 10, 28, 31, 46, 139, 349, 386, 389, 381, 405, etc. City see that streets are lighted and paved. They estab make traffic regulations and do the things which af directly.

8, 464 Look closely for the policemen in these views. tem in every city preserves order and safety.

8, 11, 12, 14, 15, 16, 41, 74, 75, 76, 77, 62, 63, 64, 65, 66, state government grants city charters. Also the st the hours and conditions of labor, makes laws rega family, property, business and grants civil and po

26, 32, 52, 154 Foreign and interstate commerce is regu United States.

94, 94 Money necessary to every home is made and it

made to realize their dependence upon each other and to see that every home both gives to and receives from the whole world.

A. KINDS OF HOMES IN THE COUNTRY

In what kind of country do you live? Pick out of the list the home that is nearest like your own.

38, 262. Here are two general views of country homes in hilly lands. The houses are not crowded together, there is always room, light and air.

96 This is a wealthy home in the rolling lands of Virginia.

147 This is a home on the prairies of Illinois. What is a prairie?

181 This home is on the broad plains of Nebraska.

235, 236 There are very lovely farm homes in the valleys of California. What are mountains or valleys?

B. BUILDING MATERIALS

96 Most country homes are built of wood or brick.

368, 373 In other lands where wood is not so plentiful, country homes are made of stone.

C. ROADS

7, 71 Instead of the crowded street, is the open road. Country roads in the United States have been very poor, but now they are being paved. Almost every farmer has horses, very many have automobiles and these with good roads give country people all the advantages of both city and country.

D. FOODS

Country people raise a large part of their own food and supply the cities too.

57, 46, 159, 165, 339, 396, 403, 411, 413, 487, 45 The farmer has fresh milk and butter for himself and to sell.

56 You can not imagine a farm without chickens and fresh eggs. They are a source of wealth.

127, 159, 172, 173, 183, 185, 186, 190, 301, 480, 589 Country people raise their own meat.

47, 83, 149 Vegetables fresh from the fields have a much finer flavor than those which have to be shipped.

136, 146, 147, 177, 199, 218, 357, 408 The high cost of grain does not bother the farmer. His own bread is sure and what he sells is profit.

104, 105 In the South rice is grown.

166 The farmer expects to have potatoes to eat and still more to sell.

85, 108, 175, 235, 236, 237, 238, 294 Farmers have fruit which ripens on the vines and has a much finer flavor than that which ripens while being shipped. They buy fruit which they cannot raise just as city people do.

the readymade clothes just as city people
117, 173, 190 The cotton and wool come from th
11, 12, 41, 133, 272 Residents of farms need he
ing on the damp, rough earth.
127, 183, 186, 581 The hides from which leath
from farms and ranches.

F. HEAT AND LIGHT

144, 445 Wood is the common fuel used in countr
74, 75, 76, 77, 78, 79 Coal is also much used, e
and plains where trees are scarce.
69, 70, 122, 123 Oil is commonly used for light.

G. OCCUPATIONS

Nearly all country people are engaged in some for stockraïsing, but just what they will raise depends u is, what kind of soil and climate it has, and its nea shipping places. A farmer's work is always varie telligence all the time. Skilful progressive farm mentally stimulating and financially profitable. A know how to run and care for machinery.

1. Agriculture

178, 179, 180 No matter what a man is raising, he plow and plant. His success depends largel tion of the land.
47, 149, 236 If he has rich ground near a city he garden. Always he will have his own kitch
83, 198, 184, 419 As soon as the plants are well s tivate and free from weeds.
85, 175, 236, 237, 238, 44 If he has an [illegible]

124, 125 When ripe the cotton crop must be taken to the gin to be prepared for market.

118 Peanuts are an important crop in the warmer parts of our country.

104, 105 In the low warm lands which can easily be flooded, farmers raise rice. Here again we see the negro laborers who cultivate the fields. Negroes work easily in the warm lands.

45, 46, 57, 138, 159, 172, 173, 183, 185 He may have the pleasure of raising thoroughbred cattle or horses, sheep or hogs.

127, 186, 188, 190 Perhaps the farm is a ranch with great droves of horses, cattle or sheep roaming wild. Such farms are mostly on the plains.

a. Commerce and Transportation

The process here is just the reverse of what occurs in the city. The farmer sells food, cotton, wool and animals. These must be shipped to the city. In return he buys manufactured goods, cloth, shoes, sugar, machinery, nails, tools, coffee, tea, etc.

7, 124, 150, 152 Horses and automobiles carry the stuff away from the farm to the market, the store, the mill or the shipping place. What is your nearest market?

31, 41, 43, 61, 79, 82, 129, 128, 148, 157, 174, 223, 251, 253, 277, 323, 330, 440, 470 Long trains carry the milk, the grains, the cotton and wool, the cattle, etc., to the cities where the food may be eaten, the cotton and wool made into cloth, the grain ground into flour, and the cattle turned into meat and leather; or it may be shipped to other places. What railroads are nearest you?

48, 61, 119, 128, 157, 158, 164, 170, 174, etc. Vessels ply our rivers and canals carrying grain and other farm produce to the cities.

267, 280, 295, 304, 314, 338, 347, 374, 386, 391, 392, 400, 443, 559 And in our coast cities are ocean vessels waiting to carry our grain and cotton and meat to England and other foreign countries. Perhaps the wheat in your own field may be carried to France and there feed our own soldiers. And you may eat your own bread from a plate brought from France on the return voyage.

H. GOVERNMENT

71 Local governments in the country have far less to do than in cities. Roads are kept in order, schools are established, there are local courts.

8 Property, business, inheritances, civil and political rights are controlled by the state just as in the city.

84, 87, 88, 89, 90, 91, 92, 93, 94, 95 The federal government is over all people whether in country or city.

IV. NATURAL FEATURES OF LAND AND WATER

391 The Rhine River in Germany, an important waterway.

467 The Danube River in Central Europe, much used for navigation.

276 Sharp peaks and little glaciers in Western C
427 Mountain peaks of the French Alps.
448 A mountain peak in the Alps.
428 A glacier in the Alps. Explain what a glacier
275 A close view of the surface of a small glacier
219 Surface of a small glacier, Wash.
318 Beautiful waterfalls in South America.
576 Great waterfalls in Africa.
444 A beautiful waterfall in Switzerland.
209 A desert view in Arizona. Explain that all
this one.
194 Geyser in Yellowstone Park. Explain what a
453 A volcano in Italy.
430 A harbor in France, Cannes.
326 A harbor in South America, Valparaiso. For

50. TRAVELOGUE AND LECTURE SUGGESTIONS

By RUSSELL H. CONWELL, D.D., LL.D.

LECTURER. PRESIDENT OF TEMPLE UNIVERSITY, PHILADELPHIA

The teacher who would fully instruct or the orator who would inspire his audience finds his chief task to be in awakening the imagination of his pupils or hearers, so as to produce clear mental pictures of scenes and events. If one depends upon the spoken word, the orator or lecturer must choose those words which will awaken the thought of the hearer and call to his mind clear images of the things presented. If the student has a memory stored with clear, sharp images, a careful choice of words will bring the scene or event vividly to mind.

For the most part, however, and especially in dealing with the pupils having a limited range of personal experiences and whose opportunity for travel has been limited, more than words are needed. Fortunate is the teacher who in dealing with the child has at hand such a wealth of concrete, helpful illustrations as are contained in this Keystone "600 Set" of stereographs and lantern slides. They deal with a wide range of school topics and in a clear and effective way.

The work with the lantern slides will naturally be held to the review of the work covered by the study of the stereographs in the regular course. For this, one can not too strongly recommend the plan of having the pupils give the description for the slides as presented. Such a method will accomplish much in inspiring the pupil with confidence in appearing in this prominent way before the class, but it also provides a most excellent drill in oral composition and public speaking. The child who appears before the class and expresses his ideas in a clear, confident way gets a training that will be helpful to him throughout life.

One of the vital problems for every progressive superintend-

nistory, etc. It brings the classroom ins
touch with the home, and arouses an inter
children are doing. At the same time ap
larger audience, gives the pupil a still gr
does appearing before the class.

It may be that the principal in using the
conducting an exercise with the children wi
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A visit to the country in other lands.
A visit to the city in U. S. and possessions.
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Abbreviations used in this index are as follows:

Am. Today = America of Today
An. = Animals
An. Hus. = Animal Husbandry
Arct. = Architecture.
Biog. = Biography
Children = Children of the World
Cities = The Cities of the World
Com. Civ. = Community Civics
Con. Stone B. & T. = Concrete, Stone, Brick and Tile
Cos. Dsn. = Costume Design
Dev. Na. = The Development of the Nation
Draw. = Drawing
Earth N. = Earth Neighbors
Eat & Wear = Some Things We Eat, Some Things We Wear
Eng. Comp. = English Composition
F. Am. Na. = Foundations of the American Nation
Farm C. = Farm Crops
Farm H. & F. L. = Farm Home and Farm Life
Farm M. = Farm Management — Farm Machinery
Food & Ckry. = Food & Cookery
For. Beg. = Foreign Beginnings of American History
Geo. = Geographical Classification
Gdn. Orch. & W. = Garden, Orchard and Woodlot
Govt. = Government
Home Geo. = Home Geography
House Adm. = Household Administration

Ntl. F. = Natural Forms and Forces (Physical Ge
Out Door L. = Out Door Life
p. = Page
pp. = Pages
Peo. = People of All Lands (Racial Geography)
Photo. = Photography
Pl. & An. = Plants and Animals
Pl. Asso. = Plants and Plant Associations
Pol. Geo. = Geography by Nations (Political Geogr
Prod. Mfg. = Production and Manufacturing
Read. = Reading
S. No. = Serial Number
Soils = Soils
Sp. = Spelling
Tex. & Cl. = Textiles and Clothing
Trans. = Transportation
Trav. & Lec. = Travelogue and Lecture Suggestions
Vis. Prob. = Visualized Problems
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Wood = Wood
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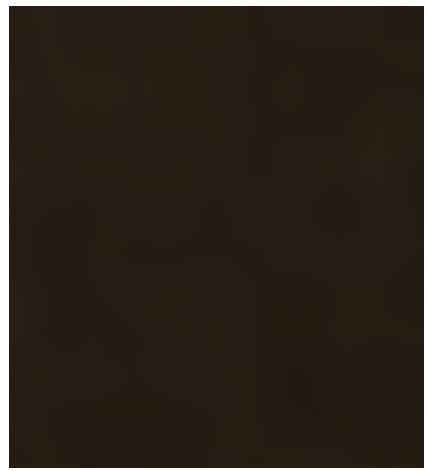
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